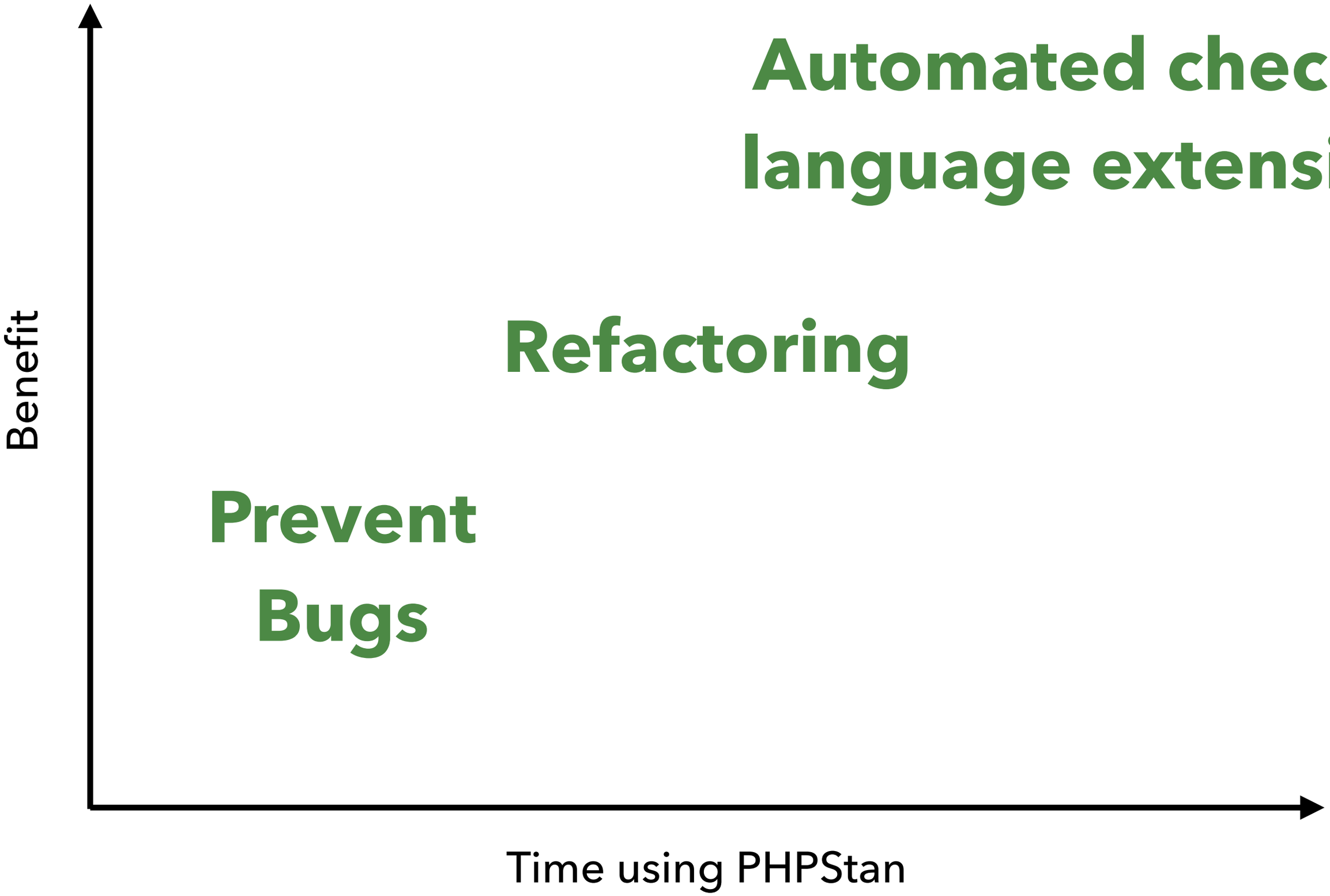
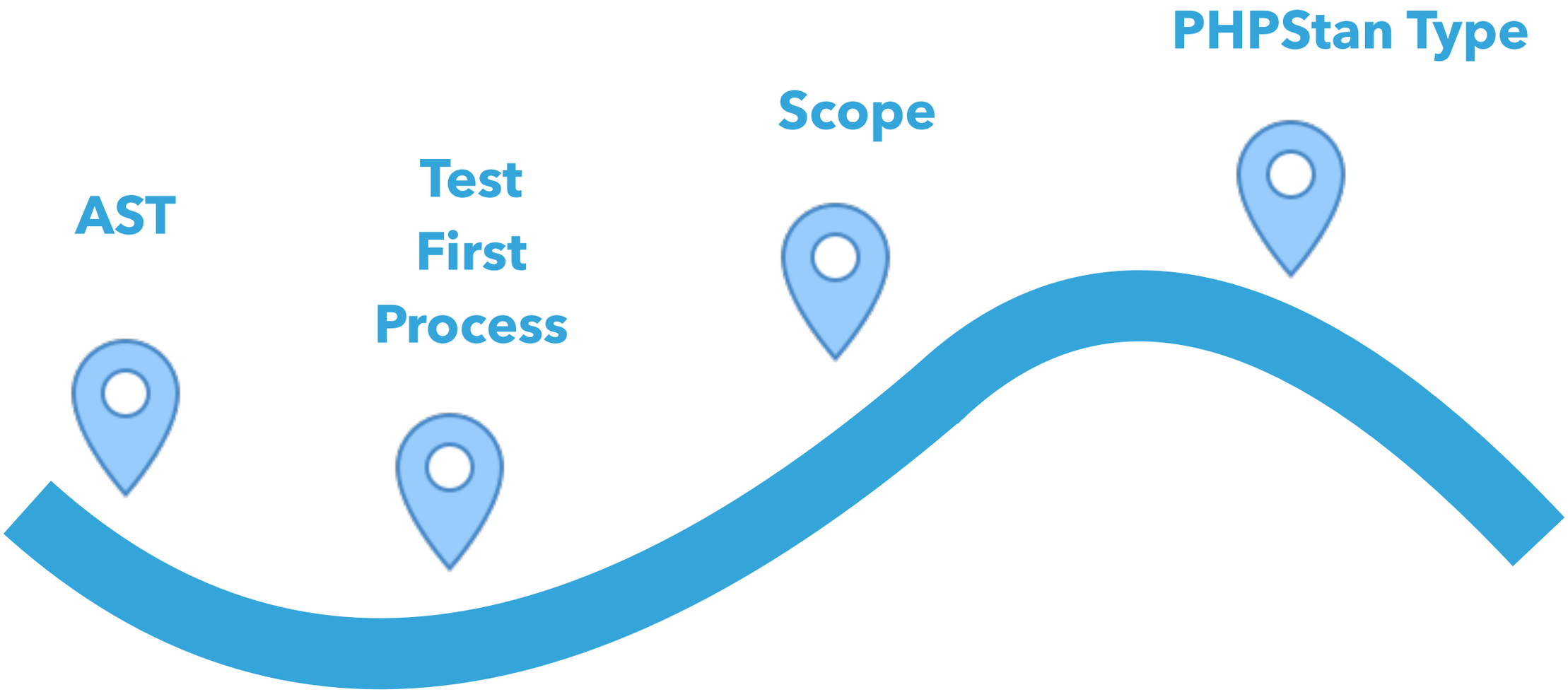
Writing your own custom PHPStan rules

Dave Liddament **@DaveLiddament**

Lamp Bristol **@DaveLiddament@phpc.social**

github.com/DaveLiddament/phpstan-rules-tutorial


Benefit
Automated checks,
language extension
Refactoring
Prevent
Bugs
Time using PHPStan

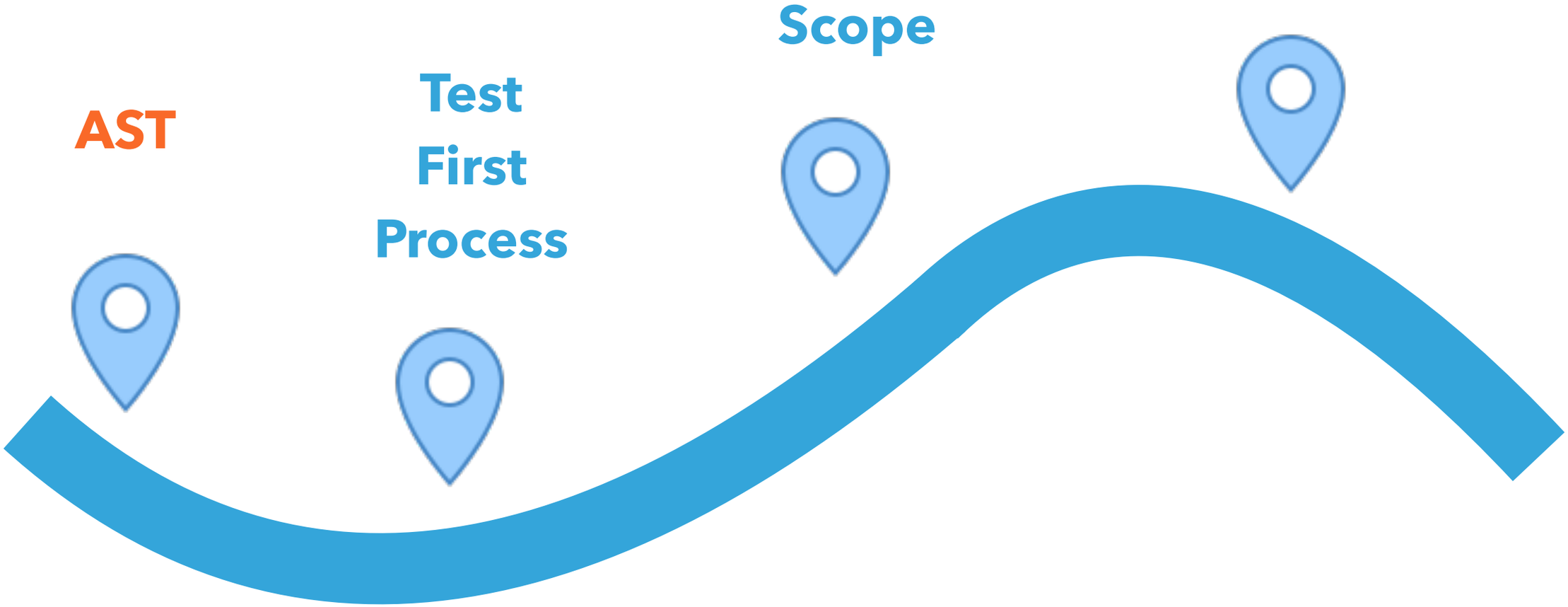

AST
Test
First
Process
Scope
PHPStan Type

AST

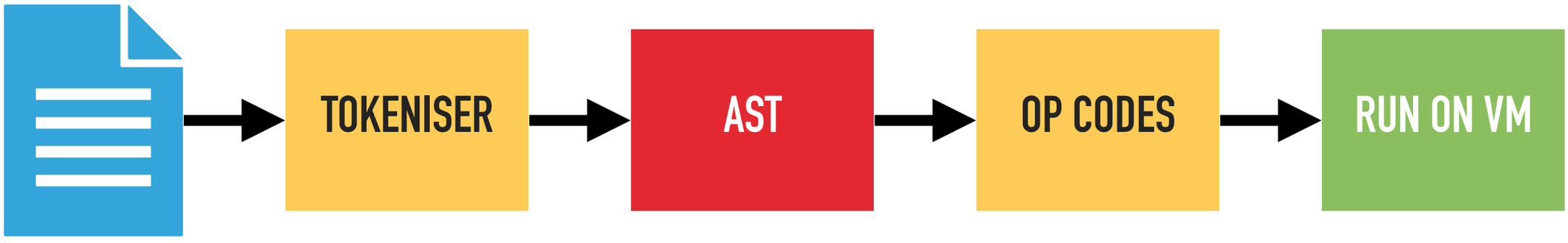
Test First Process

Scope

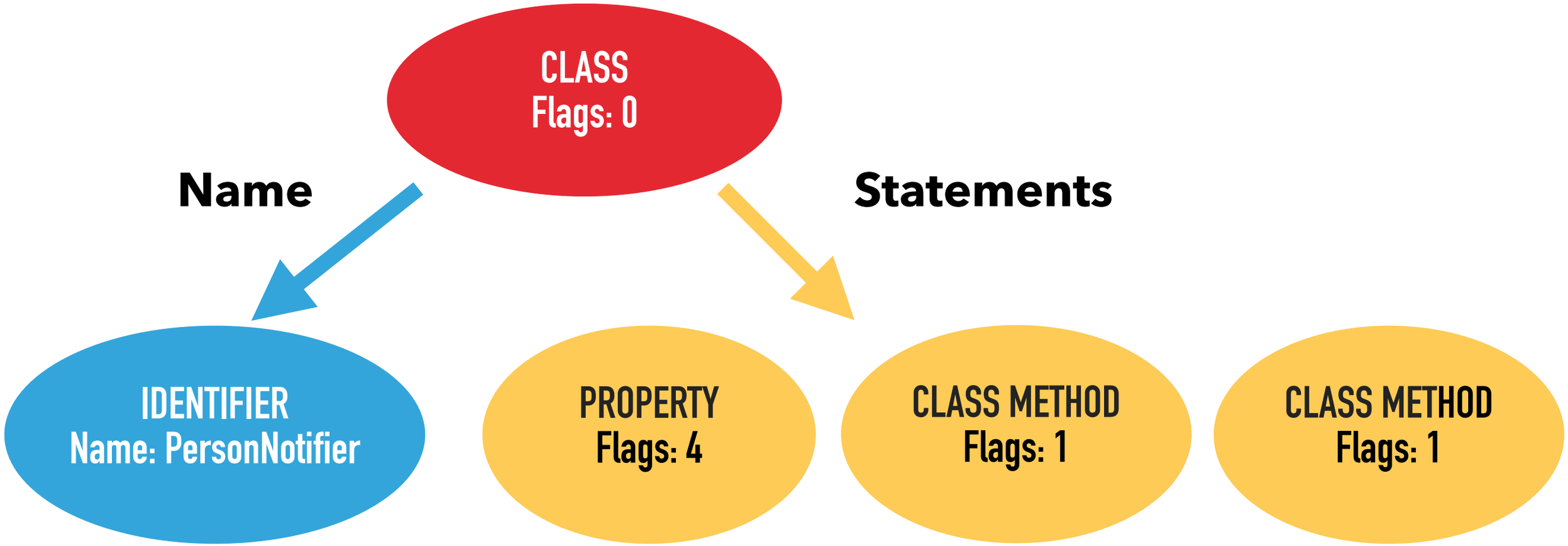
PHPStan Type



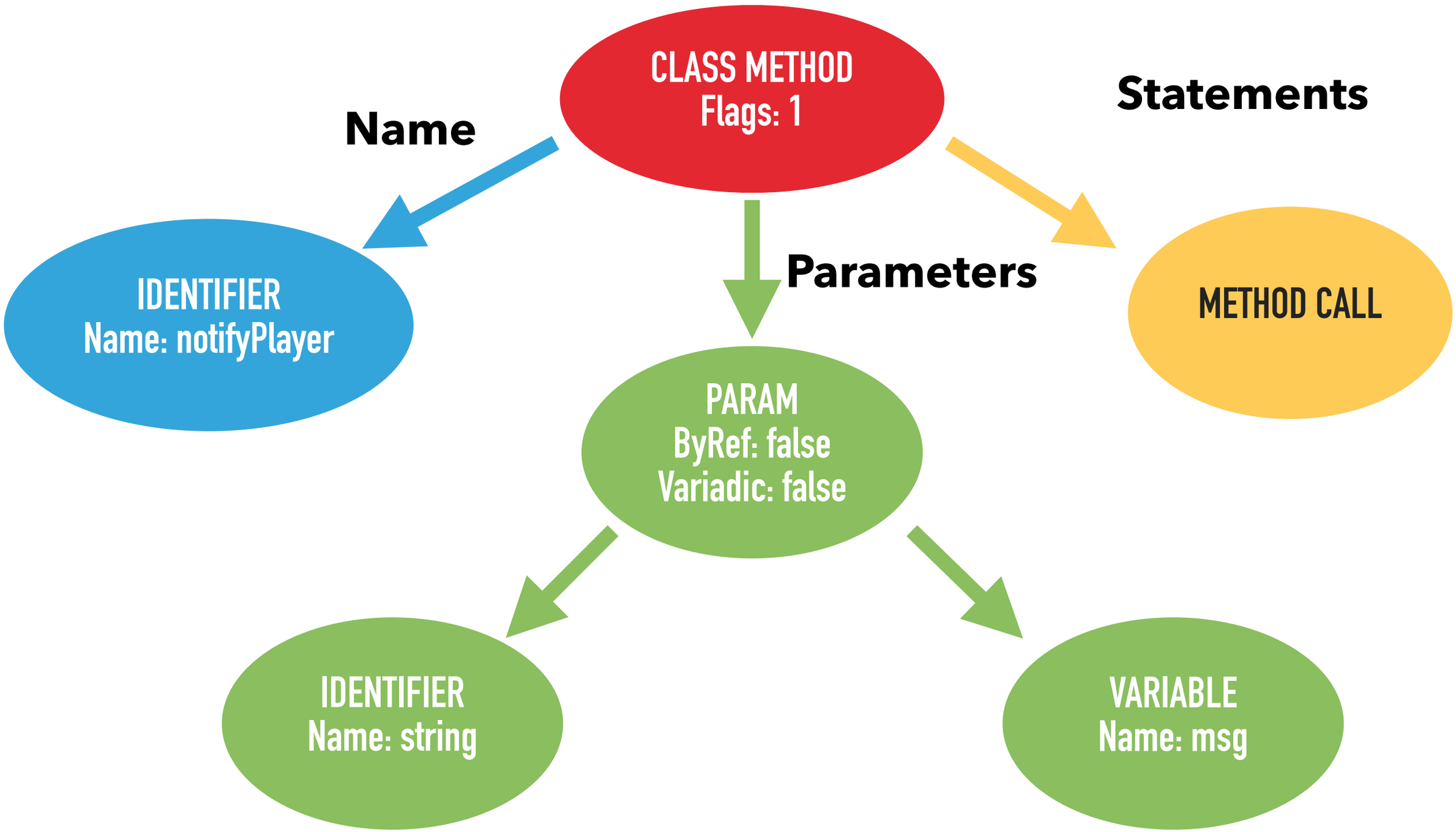
@daveliddament


TOKENISER
AST
OP CODES
RUN ON VM

```
class PersonNotifier
{
    private TextMessageSender $sender;

    public function __construct() {…}

    public function notifyPlayer() {…}
}
```



```
public function notifyPlayer (string $msg)
{
    $this->sender->sendMessage($msg);
}
```



https://github.com/nikic/PHP-Parser

nikic / PHP-Parser Public

Watch 232 | Fork 891

Code | Issues 44 | Pull requests 9 | Actions | Wiki | Security | Insights

master | 9 branches | 80 tags | Go to file | Add file | Code

nikic Bail out on PHP tags in removed code ... b0edd4c 2 hours ago 1,526 commits

.github/workflows	Test PHP 8.2 in CI	3 days ago
bin	Add --version flag to php-parse	17 days ago
doc	Fix pretty printing example	17 days ago
grammar	Support readonly before DNF type	3 days ago
lib/PhpParser	Bail out on PHP tags in removed code	2 hours ago
test	Bail out on PHP tags in removed code	2 hours ago
test_old	Avoid repeatedly downloading archive in run-php-src.sh	2 months ago
tools	Add tools/ directory	10 days ago
.editorconfig	[PHP 8.1] Add support for enums (#758)	17 months ago
.gitattributes	Add CONTRIBUTING.md	23 days ago
.gitignore	gitignore: add phpunit test cache	3 years ago
.php-cs-fixer.dist.php	Also format the grammar directory	23 days ago
CHANGELOG.md	Release PHP-Parser 5.0.0-alpha1	17 days ago
CONTRIBUTING.md	Add CONTRIBUTING.md	23 days ago
LICENSE	Corrected license text	2 years ago
README.md	Partial documentation update	17 days ago
UPGRADE-1.0.md	Fix typos	8 years ago

About

A PHP parser written in PHP

php | parser | static-analysis | ast

Readme

BSD-3-Clause license

15.7k stars

232 watching

891 forks

Releases 76

PHP-Parser 4.15.1 Latest

18 days ago

+ 75 releases

Packages

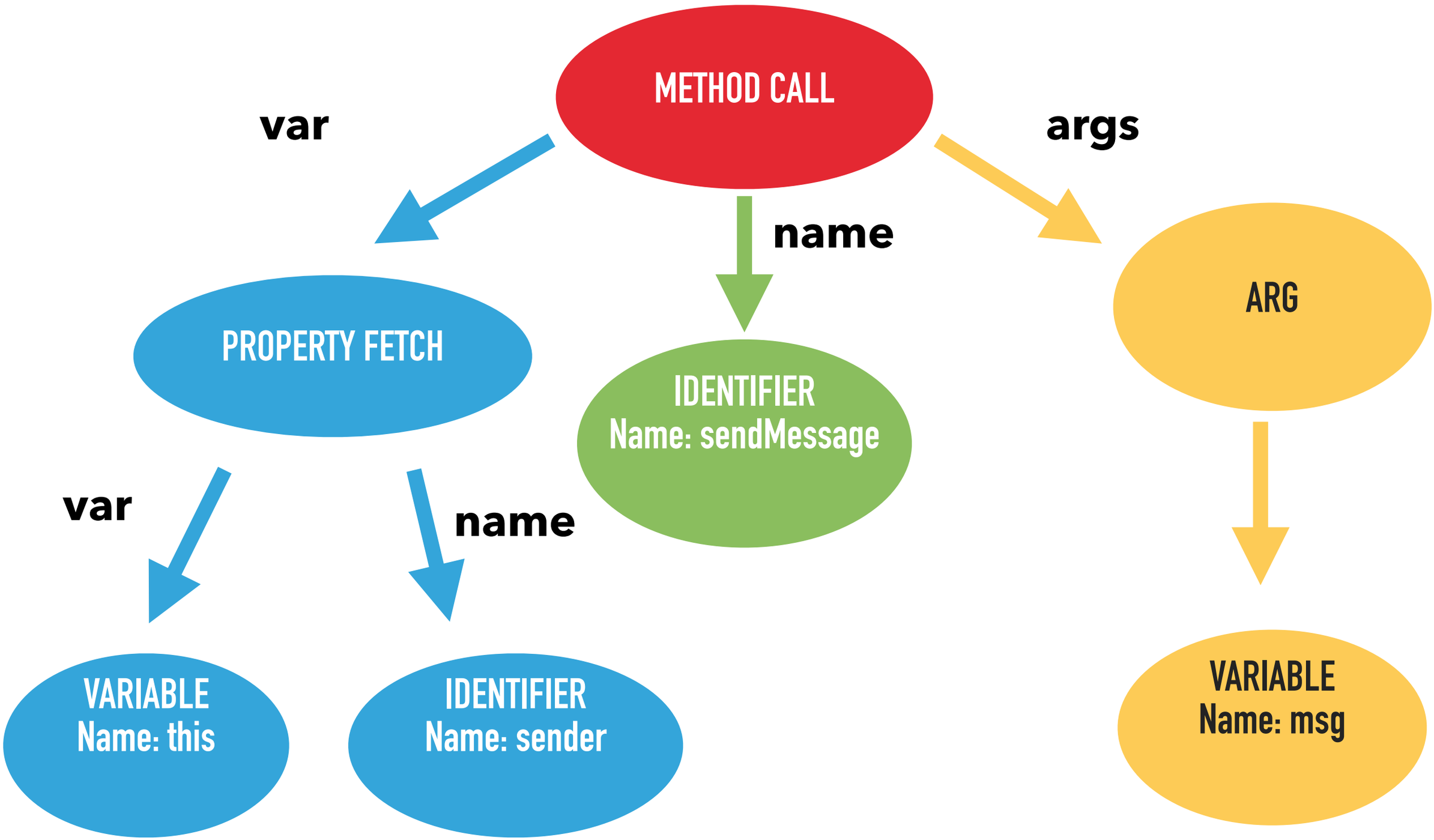
No packages published

Used by 1.5m

+ 1,486,143

Contributors 123

```
$this->sender->sendMessage($msg);
```



```
class MethodCall extends \PhpParser\Node\Expr\CallLike
{
    /** @var Expr Variable holding object */
    public $var;

    /** @var Identifier|Expr Method name */
    public $name;

    /** @var array<Arg|VariadicPlaceholder> Arguments */
    public $args;

    // Rest of class …
```

```
$this->sender -> sendMessage ($msg) ;
```

- PHP code can be represented by an AST
- Different types of Node
- Nodes contain information
- Each type of node has different information

CLASS
Flags: 0

IDENTIFIER
Name: PersonNotifier

PROPERTY
Flags: 4

CLASS METHOD
Flags: 1

CLASS METHOD
Flags: 1

IDENTIFIER
Name: notifyPlayer

PARAM
ByRef: false
Variadic: false

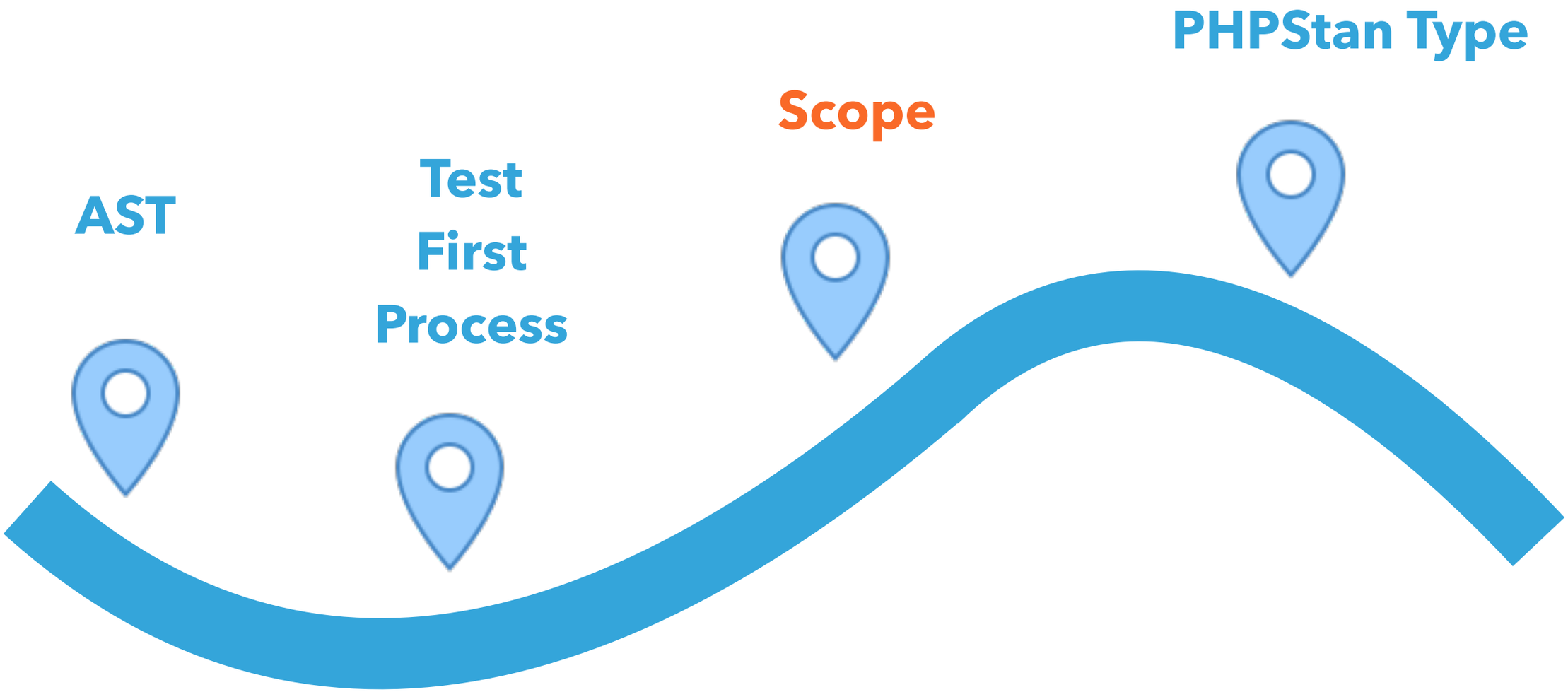
METHOD CALL

IDENTIFIER
Name: string

VALUE
ByRef: false
Variadic: false

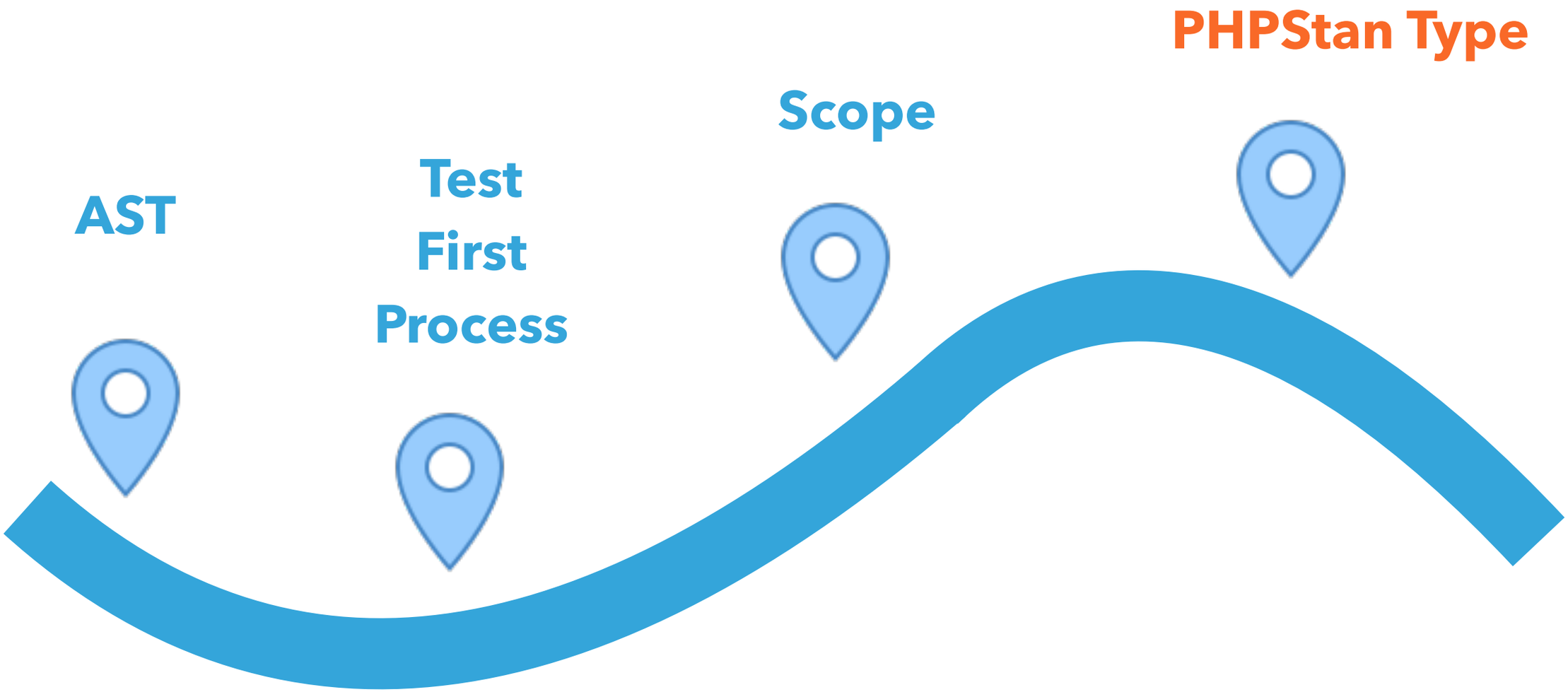

AST
Test First Process
Scope
PHPStan Type

```
interface Rule
{

  public function getNodeType() : string;


  /**
   * @return (string|RuleError)[] errors
   */
  public function processNode(
    \PhpParser\Node $node,
    \PHPStan\Analyser\Scope $scope
  ) : array;

}
```


AST
Test
First
Process
Scope
PHPStan Type

Information for current AST node

```
$scope
  ->getFile()
  ->getNamespace()
  ->getClassReflection()
  ->getFunction()
  ->getType()
```


AST
Test
First
Process
Scope
PHPStan Type

```
$scope->getType(
        Expr $expression,
): PHPStan\Type\Type
```

Type offers methods including:

```
$type
  ->getReferencedClasses(): array;
  ->isBoolean(): TrinaryLogic
  ->isTrue(): TrinaryLogic
  ->isString(): TrinaryLogic
  ->hasMethod(): TrinaryLogic
  ->isSuperTypeOf($type): TrinaryLogic
```

…

TrinaryLogic

```
$isString = $type->isString();

if ($isString->yes()) {
    // $type is a string
} else if ($isString->maybe()) {
    // $type might be string
    // E.g. $type could be mixed, or null|string
} else {
    // $type definitely not a string.
    // E.g. $type could be int
}
```

```php
function takesValue(mixed $value): void
{
    process($value);    PHPStan\Type\MixedType

    if (!is_bool($value)) return;

    process($value);    PHPStan\Type\BooleanType

    if ($value === false) return;

    process($value); PHPStan\Type\ConstantBooleanType
}
```

```
function takesValue(mixed $value): void
{
    process($value);

    if (!is_bool($value)) return;

    process($value);

    if ($value === false) return;

    process($value);
}
```

```
Type::isBoolean()   maybe
Type::isFalse()     maybe

Type::isBoolean()   yes
Type::isFalse()     maybe

Type::isBoolean()   yes
Type::isFalse()     no
```

Does a type represent an object?

```
$testCase = new ObjectType(TestCase::class);

if ($testCase->isSuperTypeOf($otherType)->yes())
{
    // $otherType is of type TestCase

}
```

Further information

https://phpstan.org/developing-extensions/rules