phpday

VERONA (Italy) | May 15-16, 2025

Custom PHPStan Rules: Automate Standards and Save Time

Dave Liddament

phpday.it

powered by GRUSP

Using PHPStan means:

- Higher code quality
- Fewer bugs

Custom rules amplify these benefits

PHPStan

Coding Standards as Code

Easy upgrades

Eliminate bugs

PHPStan

Custom Rules

Easy upgrades

Coding standards as code

PHPStan rule

Eliminate bugs

AST

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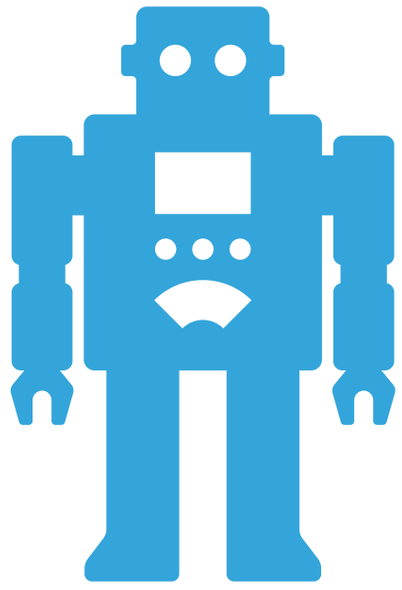
HOW TO DOCUMENT CODING STANDARDS



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Coding Standards as Code

You must follow PSR-12

URLs must be kebab-case,
parameters must be camelCase

Repository **get*** methods must
return a value or throw an exception.
Repository **find*** methods must
return a value or null.

Coding Standards as Code

php-cs-fixer

PHP_CodeSniffer

PHPStan + Custom Rules

URL is kebab-case

```
Route::put('say-hello/{firstName}');
```

Parameters are camelCase

https://spatie.be/guidelines/laravel-php#content-routing

Correct

```
Route::get('hello');
Route::post('hello/{name}');
Route::put('say-hello/{firstName}');
```

Wrong

```
Route::get('sayHello');
Route::get('hello/{first-name}');
```

```
#[Route(path: 'hello')]
```

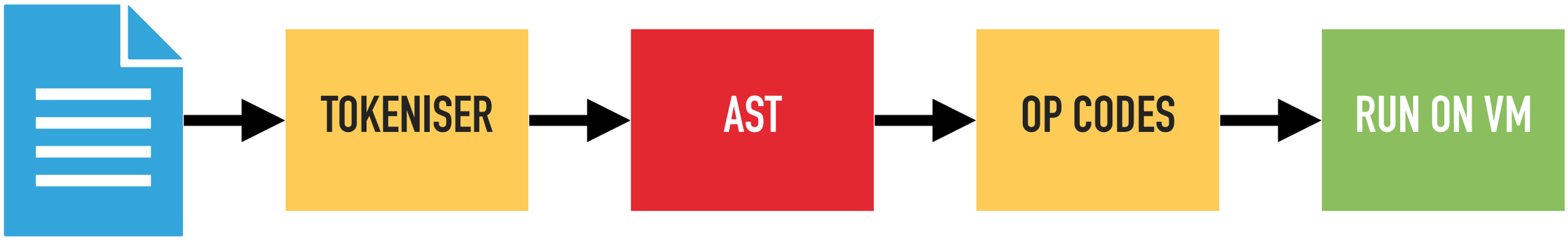
Easy upgrades

Coding standards as code

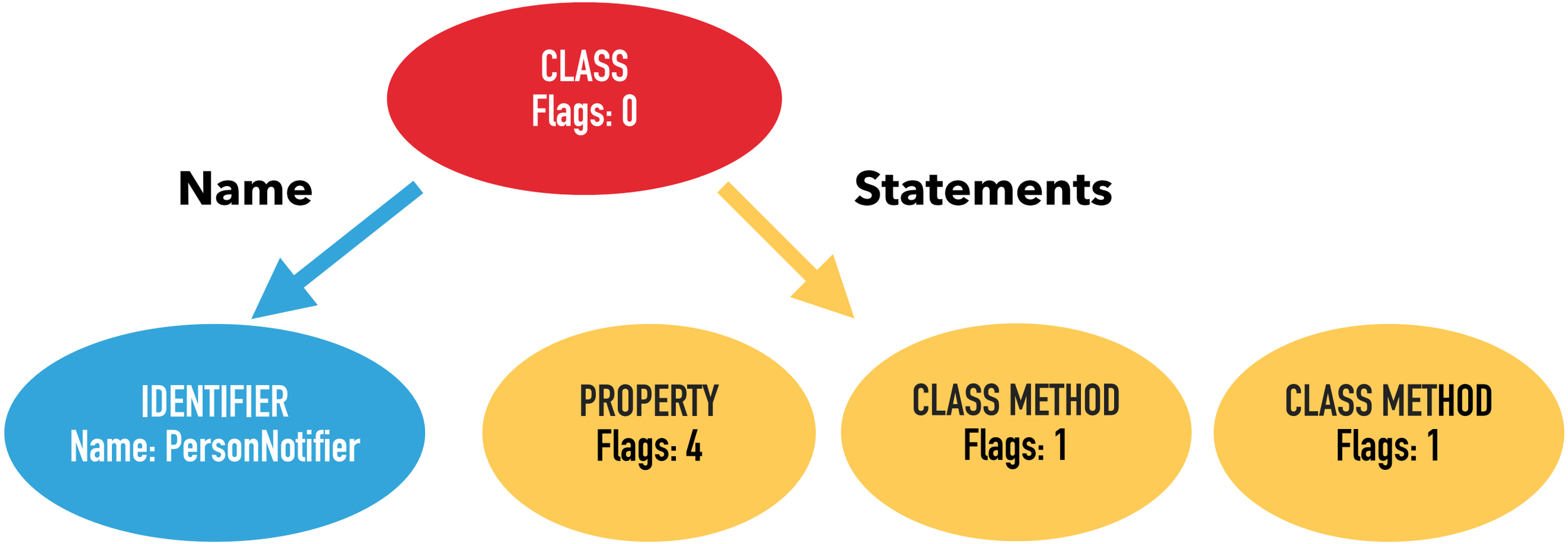
PHPStan rule

Eliminate bugs

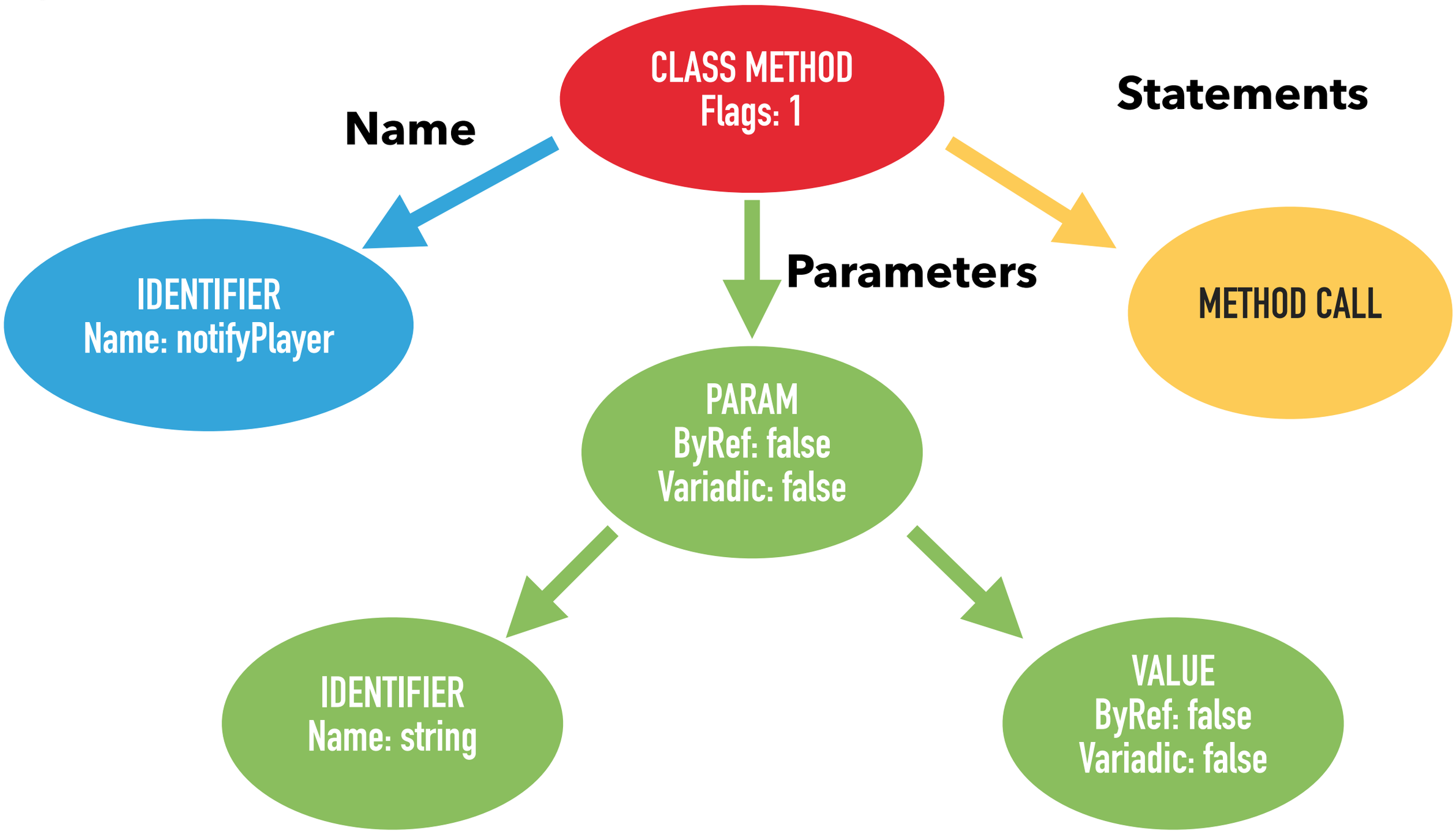
AST


TOKENISER
AST
OP CODES
RUN ON VM

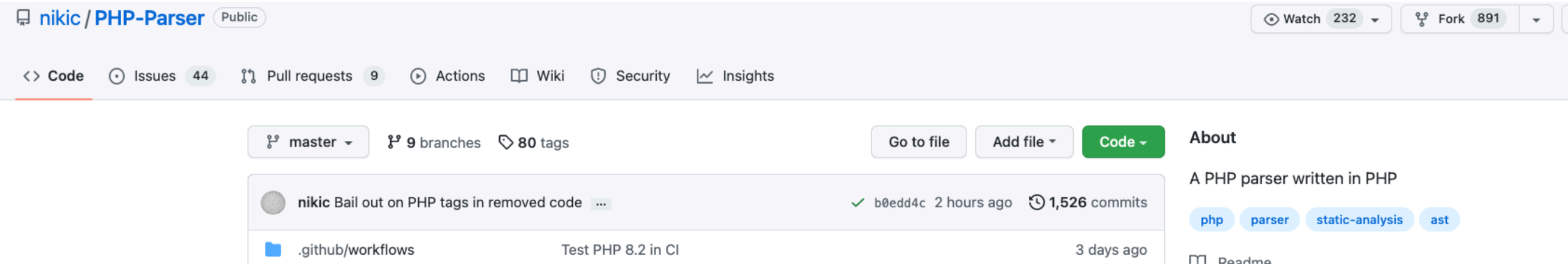
```
class PersonNotifier
{
    private TextMessageSender $sender;
    public function __construct() {…}
    public function notifyPlayer() {…}
}
```



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



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



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

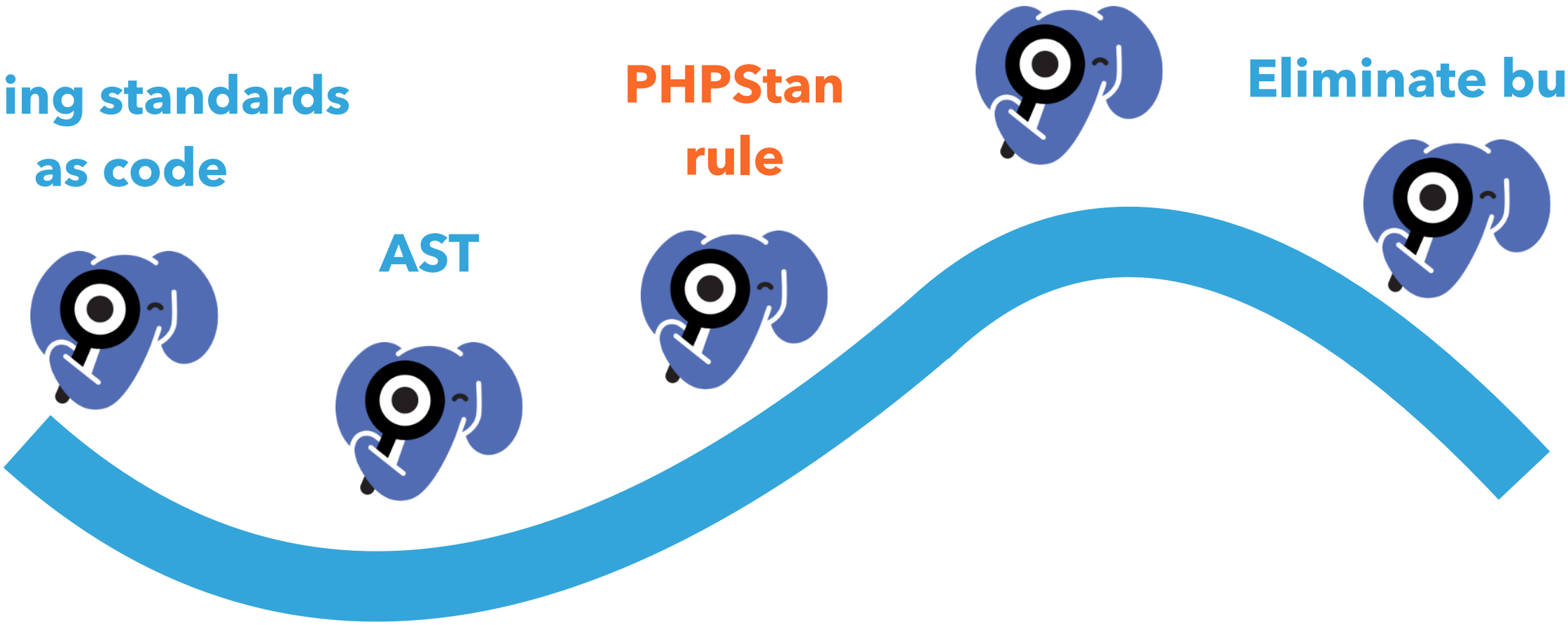
Easy upgrades

Coding standards as code

PHPStan rule

Eliminate bugs

AST



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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

```
interface Rule
{

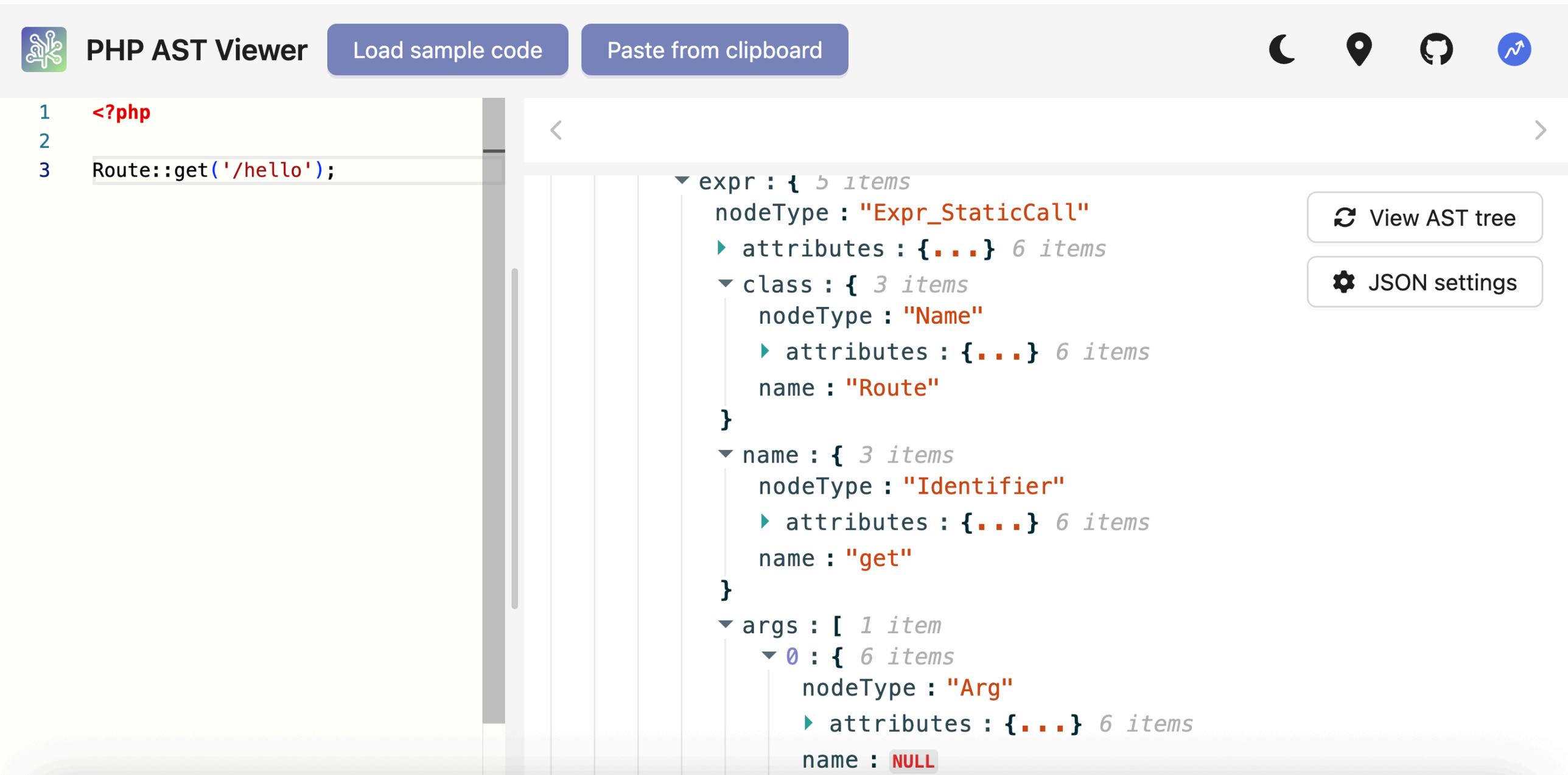
  public function getNodeType() : string;


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

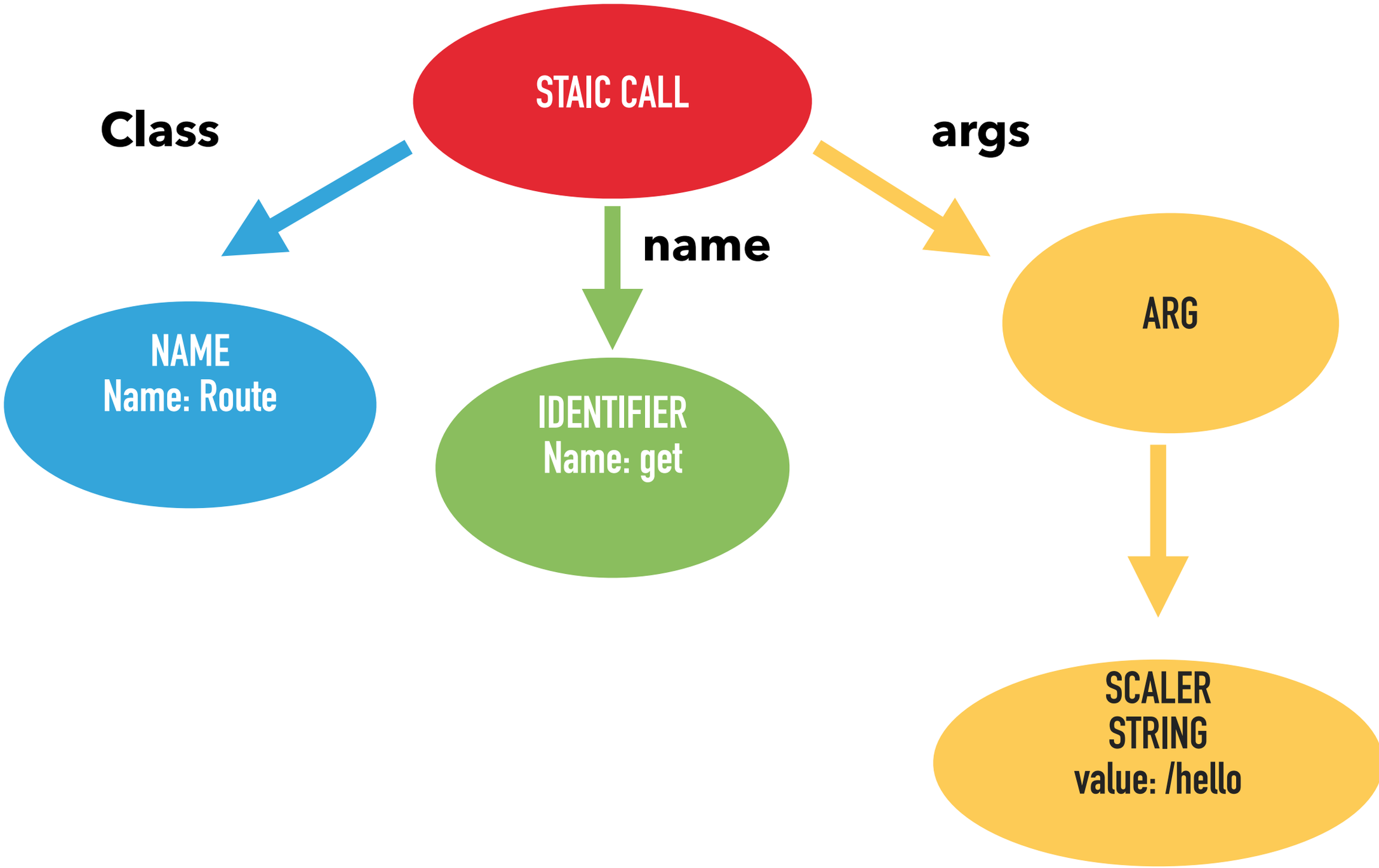
}
```

```
Route::get('/hello');
```

https://php-ast-viewer.com/



```
Route::get('/hello');
```



```
class StaticCall extends CallLike {

    /** @var Name|Expr Class name */
    public Node $class;

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

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

```
Route::get('/hello');
```

```
class RouteRule implements Rule

{

    public function getNodeType() : string
    {
        return StaticCall::class;
    }
}
```

```
public function processNode(
    Node $node,
    Scope $scope,
): array {
```

```
  // 1. Check if the class we are calling is Route

  if (!$node->class instanceof Node\Name) {
    return [];
  }

  if ($node->class->toString() !== Route::class) {
    return [];
  }
```

```
public function processNode(
    Node $node,
    Scope $scope,
): array {
  // 1. Check if the class we are calling is Route
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```
class StaticCall extends CallLike {
    /** @var Name|Expr Class name */
    public Node $class;

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

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

```
Route::get();    // Name

($className)::get();  // Expr
```

```
public function processNode(
    Node $node,
    Scope $scope,
): array {

  // 1. Check if the class we are calling is Route
  if (!$node->class instanceof Node\Name) {
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  }
```

```
if ($node->class->toString() !== Route::class) {
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}
```

```php
public function processNode(
    Node $node,
    Scope $scope,
): array {

  // 1. Check if the class we are calling is Route
  if (!$node->class instanceof Node\Name) {
    return [];
  }
```

```php
  if ($node->class->toString() !== Route::class) {
     return [];
  }
```

```
// 2. Check if the method name is get, post, put
// or delete
```

```
if (!($node->name instanceof Identifier)) {
    return [];
}
```

```
$methodName = $node->name->toLowerString();

$methodsToCheck = ['get', 'post', 'put', ‘delete'];

if (!in_array($methodName, $methodsToCheck, true)) {
    return [];
}
```

```
// 2. Check if the method name is get, post, put
// or delete

if (!($node->name instanceof Identifier)) {
    return [];
}
$methodName = $node->name->toLowerString();

$methodsToCheck = ['get', 'post', 'put', ‘delete'];

if (!in_array($methodName, $methodsToCheck, true)) {
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```

```
class StaticCall extends CallLike {

    /** @var Name|Expr Class name */
    public Node $class;

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

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

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if (!($node->name instanceof Identifier)) {
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if (!($node->name instanceof Identifier)) {
    return [];
}

$methodName = $node->name->toLowerString();

$methodsToCheck = ['get', 'post', 'put', ‘delete'];

if (!in_array($methodName, $methodsToCheck, true)) {
    return [];
}
```

```
// 3. Get the 1st argument's value if supplied

// Is first argument is an Arg
$arg = $node->args[0] ?? null;
if (!$arg instanceof Arg) {
    return [];
}

// Check if the first argument is a string
$value = $arg->value;
if (!$value instanceof String_) {
    return [];
}

// 4. Check if the value is a valid URL
if (RouteValidator::validate($value->value)) {
    return [];
}
```

```
// 3. Get the 1st arguments value if supplied

// Is first argument is an Arg
$arg = $node->args[0] ?? null;
if (!$arg instanceof Arg) {
    return [];
}

// Check if the first argument is a string
$value = $arg->value;
if (!$value instanceof String_) {
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$value = $arg->value;
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$arg = $node->args[0] ?? null;
if (!$arg instanceof Arg) {
    return [];
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// Check if the first argument is a string
$value = $arg->value;
if (!$value instanceof String_) {
    return [];
}

// 4. Check if the value is a valid URL
if (RouteValidator::validate($value->value)) {
    return [];
}
```

```
// 5. Return an error as the URL is not
valid
```

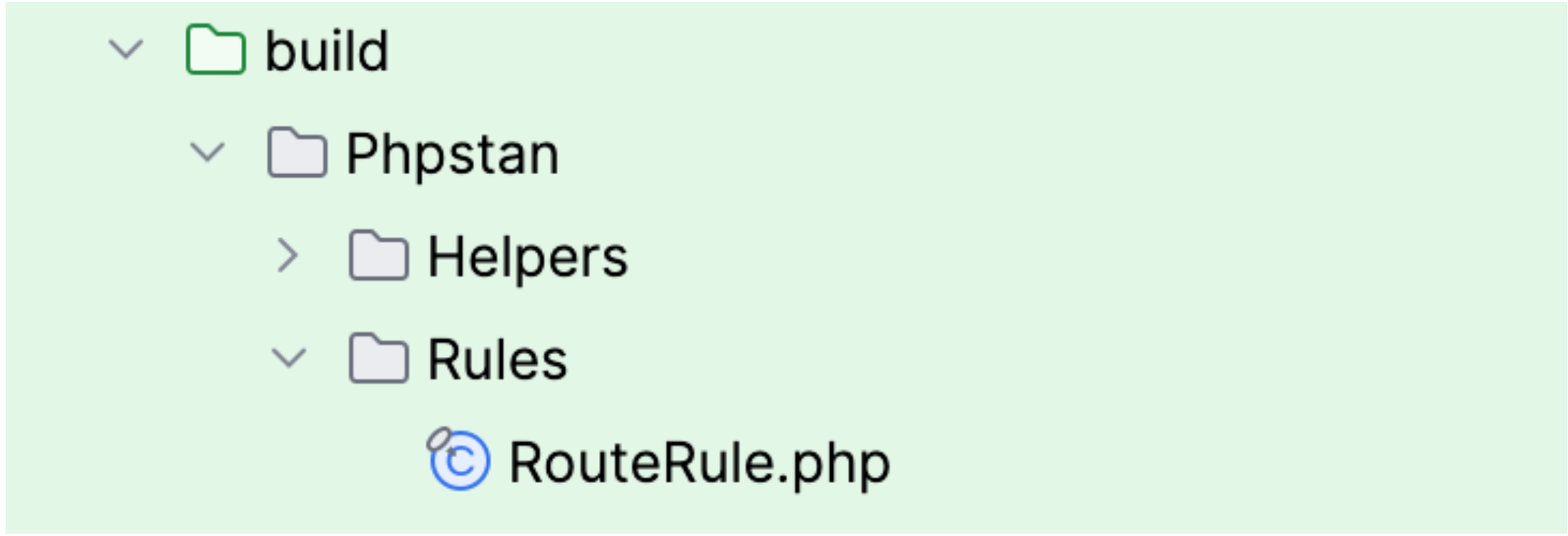
```
$msg = 'URL must be in kebab-case and any
parameters in camelCase’;

return [
    RuleErrorBuilder::message($msg)
                    ->identifier('route.url')
                    ->build()
];
```

```
// 5. Return an error as the URL is not
valid
```

```
$msg = 'URL must be in kebab-case and any
parameters in camelCase’;


return [
    RuleErrorBuilder::message($msg)
                    ->identifier('route.url')
                    ->build()
];
```




```
"autoload-dev": {
    "psr-4": {
        "DaveLiddament\\Phpstan\\": "build/Phpstan/"
    }
},
```

```
services:
-
    class: DaveLiddament\Phpstan\Rules\RouteRule
    tags:
    - phpstan.rules.rule
```

DaveLiddament / **custom-phpstan-rules-talk-example**

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custom-phpstan-rules-talk-example

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DaveLiddament Initial check in — a084282 · yesterday — 1 Commit

build/Phpstan	Initial check in	yesterday
src	Initial check in	yesterday
.gitignore	Initial check in	yesterday
LICENSE.md	Initial check in	yesterday
README.md	Initial check in	yesterday
composer.json	Initial check in	yesterday
composer.lock	Initial check in	yesterday
phpstan-upgrade.neon	Initial check in	yesterday
phpstan.neon	Initial check in	yesterday
phpunit.xml	Initial check in	yesterday

About

Example custom PHPStan rules used for enforcing coding standards

- Readme
- MIT license
- Activity
- 0 stars
- 1 watching
- 0 forks

Releases

No releases published
Create a new release

Packages

No packages published
Publish your first package

https://github.com/DaveLiddament/custom-phpstan-rules-talk-example

Easy upgrades

Coding standards as code

PHPStan rule

Eliminate bugs

AST

@daveliddament

v1.0.0

```
class AlertService {
  public function alert(
      string $message,
  ){…}
}
```

v1.1.0

```
class AlertService {
  public function alert(
      string $message,
      ?string $type = null,
  ){
      // Log if $type is null.
  }
}
```

v2.0.0

```
class AlertService {
  public function alert(
      string $message,
      string $type,
  ){…}
}
```

RUN TIME VS STATIC ANALYSIS

```
public function alert(
        string $message,
        ?string $type = null,
){
    if ($type === null) {
        @trigger_error(
            'Provide a value for $type',
            \E_USER_DEPRECATED)
    }

    … Rest of method …
```

STATIC ANALYSIS

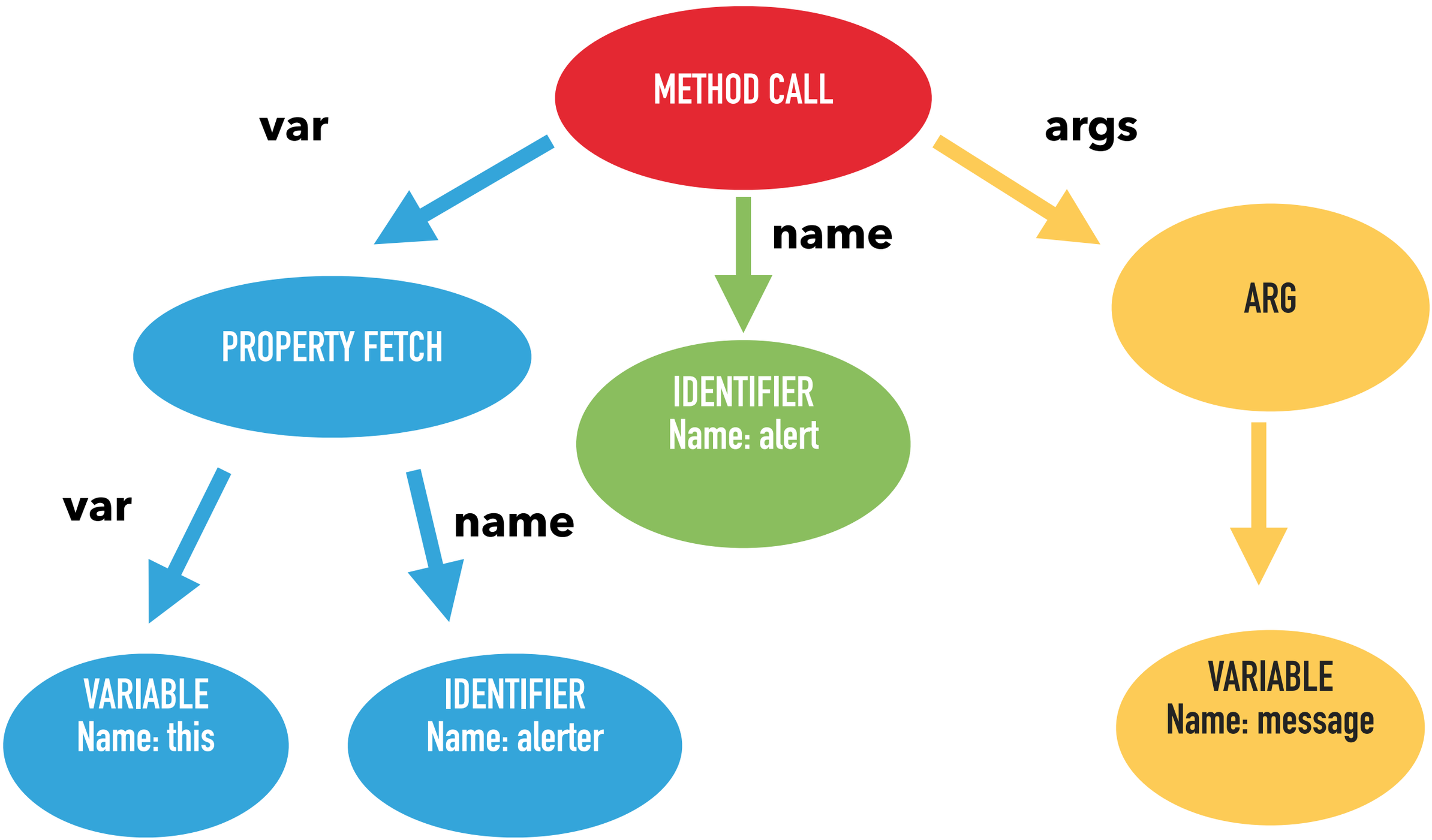
```
$this->alerter->alert($msg, $type);
```

AlertService

Missing

or null

```
$this->alerter->alert($message);
```



```
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 …
```

```
$this->alerter -> alert ($message) ;
```

```
final class AlertServiceAlertUpgradeRule
    implements Rule
{

    public function getNodeType(): string
    {
        return MethodCall::class;
    }
```

```
final class AlertServiceAlertUpgradeRule
    implements Rule
{
    public function getNodeType(): string
    {
        return MethodCall::class;
    }
```

```
public function processNode(
    Node $node,
    Scope $scope,
): array {
    // Is the call on an AlertService object?

    $objectType = new ObjectType(AlertService::class);

    $var = $scope->getType($node->var);

    if (!$objectType->isSuperTypeOf($var)->yes()) {
        return [];
    }
```

```
public function processNode(
    Node $node,
    Scope $scope,
): array {

    // Is the call on an AlertService object?

    $objectType = new ObjectType(AlertService::class);

    $var = $scope->getType($node->var);

    if (!$objectType->isSuperTypeOf($var)->yes()) {
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    }
```

```php
$this->alerter->alert($msg, $type);
```

AlertService

alert

Missing or null

```
public function processNode(
    Node $node,
    Scope $scope,
): array {

  // Is the call on an AlertService object?

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```php
public function processNode(
    Node $node,
    Scope $scope,
): array {

  // Is the call on an AlertService object?

  $objectType = new ObjectType(AlertService::class);
```

```php
  $var = $scope->getType($node->var);
```

```php
  if (!$objectType->isSuperTypeOf($var)->yes()) {
      return [];
  }
```

```php
public function processNode(
    Node $node,
    Scope $scope,
): array {

  // Is the call on an AlertService object?

  $objectType = new ObjectType(AlertService::class);
  $var = $scope->getType($node->var);

  if (!$objectType->isSuperTypeOf($var)->yes()) {
      return [];
  }
```

```
// Is the method name ‘alert'?

$name = $node->name;

if (!$name instanceof Identifier) {
    return [];
}

if ($name->toLowerString() !== 'alert') {
    return [];
}
```

```
// Is the method name ‘alert'?

    $name = $node->name;

    if (!$name instanceof Identifier) {
        return [];
    }

    if ($name->toLowerString() !== 'alert') {
        return [];
    }
```

```
// Is the method name ‘alert'?

 $name = $node->name;

 if (!$name instanceof Identifier) {
     return [];
 }

 if ($name->toLowerString() !== 'alert') {
     return [];
 }
```

```
// Does the call have at least 2 arguments

if (count($node->args) >= 2) {

    // Is the 2nd argument a string?

    $arg2 = $node->args[1];
    if ($arg2 instanceof Arg) {

        $type = $scope->getType($arg2->value);
        if ($type->isString()->yes())
            return [];
        }
    }
}
```

```
// Does the call have at least 2 arguments

if (count($node->args) >= 2) {

    // Is the 2nd argument a string?

    $arg2 = $node->args[1];
    if ($arg2 instanceof Arg) {

        $type = $scope->getType($arg2->value);
        if ($type->isString()->yes())
            return [];
        }
    }
}
```

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// Does the call have at least 2 arguments

if (count($node->args) >= 2) {

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    $arg2 = $node->args[1];
    if ($arg2 instanceof Arg) {
        $type = $scope->getType($arg2->value);
        if ($type->isString()->yes())
            return [];
        }
    }
}
```

```
// Does the call have at least 2 arguments
if (count($node->args) >= 2) {
    // Is the 2nd argument a string?
    $arg2 = $node->args[1];
    if ($arg2 instanceof Arg) {
        $type = $scope->getType($arg2->value);
        if ($type->isString()->yes())
            return [];
        }
    }
}
```

```
        // If we've got this far, there is a problem.

        $msg = '$type argument must be a string';

        return [
            RuleErrorBuilder::message($msg)
                ->identifier('demoLibUpgrade.AlertService')
                ->build(),
        ];
    }
}
```

- Deprecated classes
- Deprecated methods
- Removed parameters

HOW DO I SHARE WITH OTHERS?

MY LIBRARY

MY LIBRARY V1 TO V2 UPGRADE RULES

composer.json

```
{
  “name”: “acme/my-library-v1-v2-upgrade-rules”,

  “type”: “phpstan-extension”,

  “require”: {
      “acme/my-library” : “1.1.*”,
      … other packages …
  },

  “extra”: {
    “phpstan”: {“includes”: [“extension.neon”]}
  },

  … rest or composer.json …
```

composer.json

```
{
 “name”: “acme/my-library-v1-v2-upgrade-rules”,

 “type”: “phpstan-extension”,

 “require”: {
      “acme/my-library” : “1.1.*”,
      … other packages …
},

“extra”: {
  “phpstan”: {“includes”: [“extension.neon”]}
},

… rest or composer.json …
```

composer.json

```
{
 “name”: “acme/my-library-v1-v2-upgrade-rules”,

 “type”: “phpstan-extension”,

 “require”: {
     “acme/my-library” : “1.1.*”,
     … other packages …
},

“extra”: {
   “phpstan”: {“includes”: [“extension.neon”]}
},

… rest or composer.json …
```

composer.json

```
{
 “name”: “acme/my-library-v1-v2-upgrade-rules”,

 “type”: “phpstan-extension”,

 “require”: {
      “acme/my-library” : “1.1.*”,
      … other packages …
},

“extra”: {
  “phpstan”: {“includes”: [“extension.neon”]}
},

… rest or composer.json …
```

extension.neon

```
services:
-
	class: Acme\MyLibrary\UpgradeRule
	tags:
	- phpstan.rules.rule
```

MULTIPLE PHPSTAN CONFIG FILES

phpstan-upgrade.neon

```
parameters:
  customRulesetUsed: true
  paths:
     - src

includes:
   - vendor/acme/upgrade/extension.neon
```

---

phpstan analyse -c phpstan-upgrade.neon

Easy upgrades

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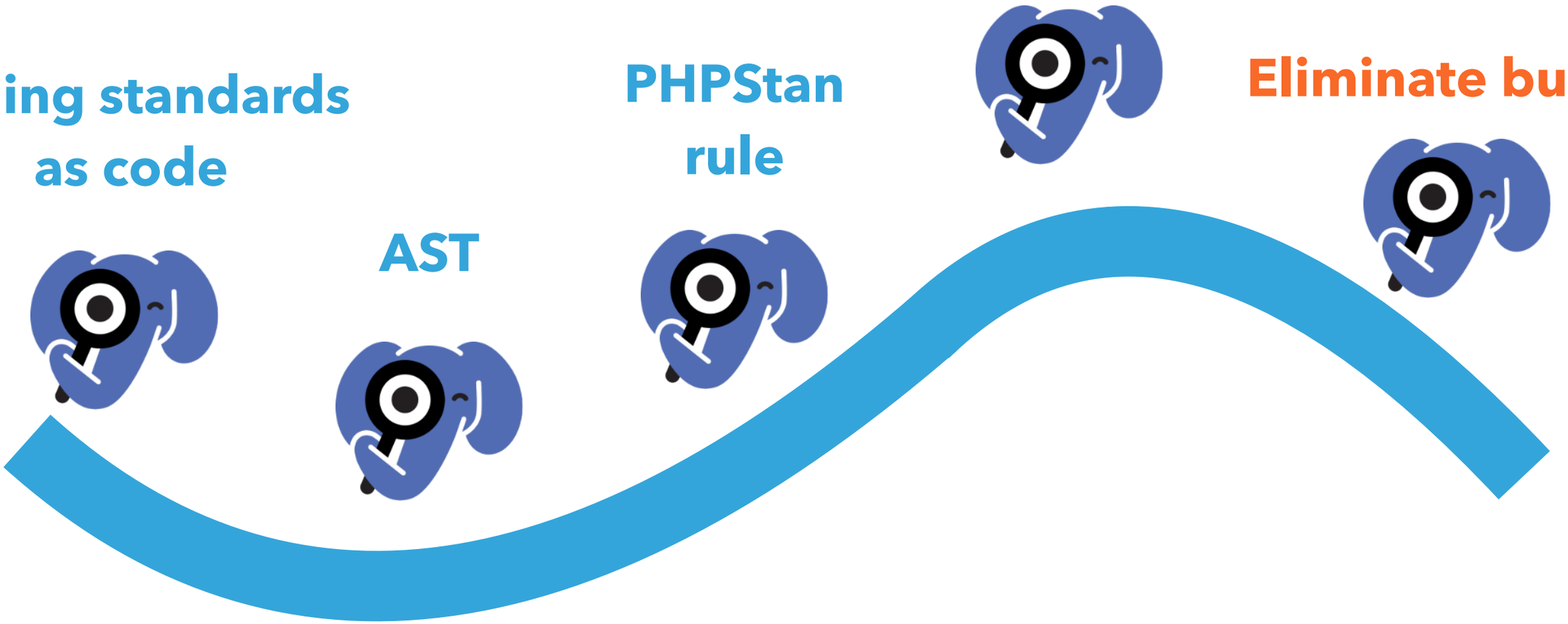
PHPStan rule

Eliminate bugs



```
class MyRule implements Rule
{
}
```

```
final class CheckRuleIsInExtension
    implements Rule

{
    public function getNodeType(): string
    {
        return InClassNode::class;
    }
```

```
final class CheckRuleIsInExtension
    implements Rule

{
    public function getNodeType(): string
    {
        return InClassNode::class;
    }
```

```
public function processNode(
    Node $node,
    Scope $scope,
): array {
```

```
    $classReflection = $scope->getClassReflection();

    if (!$classReflection->isSubclassOf(Rule::class)){
        return [];
    }

    if ($classReflection->isAbstract()) {
        return [];
    }
```

```
public function processNode(
    Node $node,
    Scope $scope,
): array {

    $classReflection = $scope->getClassReflection();
    if (!$classReflection->isSubclassOf(Rule::class)){
        return [];
    }

    if ($classReflection->isAbstract()) {
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   if (!$classReflection->isSubclassOf(Rule::class)){
      return [];
   }

   if ($classReflection->isAbstract()) {
      return [];
   }
```

```
if (ExtensionFileChecker::isInFile($className) {
   return [];
}
```

```
$msg = "Rule [$className]not in extension.neon.”;

return [
   RuleErrorBuilder::message($msg)->build(),
];
```

```
if (ExtensionFileChecker::isInFile($className) {
  return [];
}
```

```
$msg = "Rule [$className]not in extension.neon.”;

return [
  RuleErrorBuilder::message($msg)->build(),
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- Higher code quality
- Fewer bugs

Custom rules amplify these benefits

PHPStan

Coding Standards as Code

Easy upgrades

Eliminate bugs

Dave Liddament

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@daveliddament.bsky.social

github.com/DaveLiddament

www.linkedin.com/in/daveliddament/

Me when I'm not coding!

github.com/DaveLiddament/phpstan-rule-test-helper

github.com/DaveLiddament/sarb

github.com/DaveLiddament/php-language-extensions

php
language
extensions

#[Friend]
#[MustUseResult]
#[NamespaceVisibility]
#[InjectableVersion]
#[Override]
#[RestrictTraitTo]
#[TestTag]

Further information

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