An Introduction To Drupal Services

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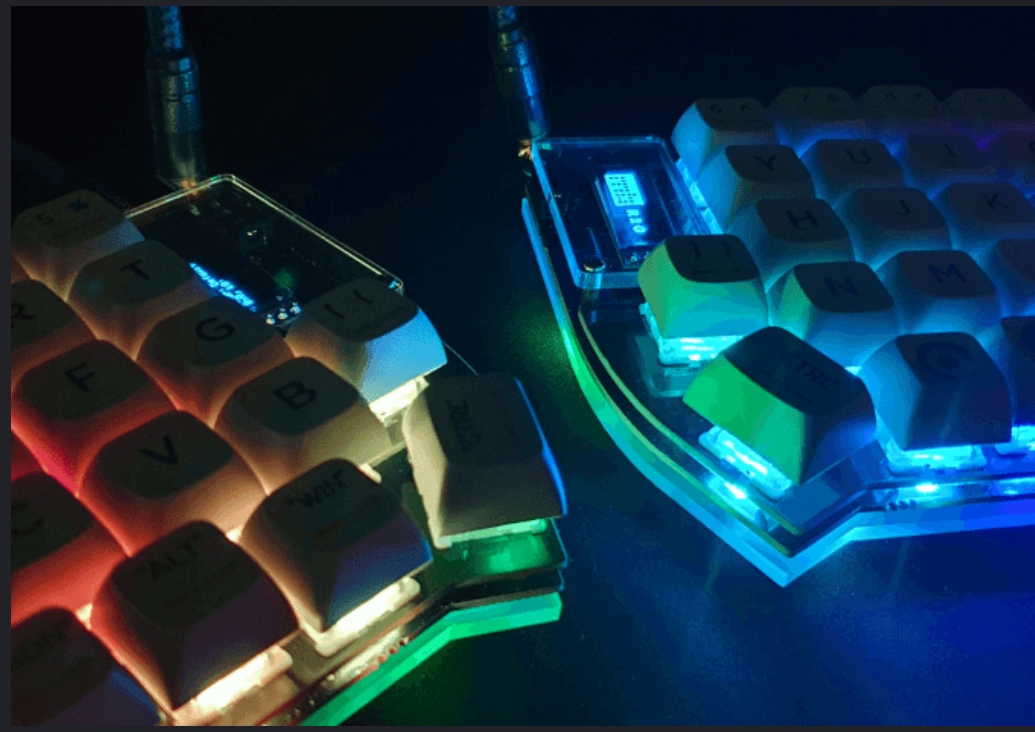


Source Code

- Talk is available at: https://github.com/hashbangcode/drupal-services-talk or via QR code.
- All code seen can be found at https://bit.ly/4h089yN
- www.hashbangcode.com

An Introduction To Drupal Services

Why Talk About Services?

What Is A Service?

- Used in all parts of Drupal and many modules.
- Built on the **Symfony Service Container** system.
- A service describes an object in Drupal.
- **Dependency injection** is used to inject services into other services.
- Services make unit testing much easier.
- Simple to use and powerful.

Using A Service

Using A Service

- Services can be accessed via the Drupal object.

```
$serviceObject = \Drupal::service('thing');
```

Using A Service

- To use a service, pick the service you need.
- Use it.

```
$pathManager = \Drupal::service('path_alias.manager');
$normalPath = $pathManager->getPathByAlias('somepath');
```

Using A Service

- You can also chain the call.

```
$normalPath = \Drupal::service('path_alias.manager')->getPathByAlias('somepath');
```

What Services Exist?

What Services Exist?

- There are lots!

```
drush eval "print_r(\Drupal::getContainer()->getServiceIds());"
```

- Prints a list of over 600 services in Drupal core.
- Most are in the form `date.formatter`.
- Some are in the form `Drupal\Core\Datetime\DateFormatterInterface`, and are used in autoloading.

Using A Service

- Most of the time you don't want to be using `\Drupal::service()`.
- Unless you are running code in a hook you should be injecting services into your own code.
- Drupal will handle what services are needed to create your needed service.
- This is called **dependency injection**.

Dependency Injection

A quick introduction.

Dependency Injection

Dependecy injection sounds complicated, but its just the practice of **injecting the things the object needs**, instead of **baking them into the class**.

Dependency Injection

- Let's say you had this class (not a Drupal thing).

```
class Page {
  protected $database;
  public function __construct($dbname, $username, $password) {
    $this->database = new PDO('mysql:host=localhost;dbname='. $dbname, $username, $password);
  }
}
$page = new Page('test', 'username', 'password');
```

- What happens if you want to change the credentials? Or change the database itself?
- You would need to edit the class or the creation code.

Dependency Injection

- We can change this to inject the database dependency as we create the Page object.

```
class Page {
  protected $database;
  public function __construct(DbConnectionInterface $database) {
    $this->database = $database;
  }
}
$database = new MysqlDatabase($dbname, $username, $password);
$page = new Page($database);
```

Creating Your Own Services

Creating Services

- Custom services are defined in a `[module].services.yml` file in your module directory.

```
services:
  services_simple_example.simple_service:
    class: \Drupal\services_simple_example\SimpleService
```

Creating Services

- Create the class for your service.

```php
<?php

namespace Drupal\services_simple_example;

class SimpleService implements SimpleServiceInterface {

  public function getArray():array {
    return [];
  }
}
```

Creating Services

- You can now use your service like any Drupal service.

```
$simpleService = \Drupal::service('services_simple_example.simple_service');
$array = $simpleService->getArray();
```

Creating Services - Arguments

- Most commonly, we want to inject our service dependencies.

```
services:
  services_argument_example.single_argument:
    class: \Drupal\services_argument_example\SingleArgument
    arguments: ['@password_generator']
```

Creating Services - Arguments

- Your services can accept a number of arguments.
  - `@` for another service (`@password_generator`).
  - `%` for a parameter (`%site.path%`).
  - 'config' = A string, in this case ‘config’.

Creating Services - Arguments

- Our service class needs to accept the arguments in the constructor.

```php
<?php

namespace Drupal\services_argument_example;

use Drupal\Core\Password\PasswordGeneratorInterface;

class SingleArgument implements SingleArgumentInterface {

  public function __construct(protected PasswordGeneratorInterface $passwordGenerator) {
  }
}
```

Creating Services - Arguments

- The service can be used within the class.

```
class SingleArgument implements SingleArgumentInterface {

  public function __construct(protected PasswordGeneratorInterface $passwordGenerator) {
  }

  public function generate12CharacterPassword():string {
    return $this->passwordGenerator->generate(12);
  }
}
```

Creating Services - Arguments

- You can now use your service.

```
$singleArgument = \Drupal::service('services_argument_example.single_argument');
$password = $singleArgument->generate12CharacterPassword();
```

Creating Services - Autowiring

- You don't need to add all of your dependencies by hand, you can use autowiring to do this for you.
- Autowiring works by nominating services that correspond to interfaces.

```
services:
  Drupal\Core\Password\PasswordGeneratorInterface: '@password_generator'
```

Creating Services - Autowiring

- Then, we need to add the `autowire: true` directive to the service definition for our service.

```
services:
  services_autowire_example.autowire_example:
    class: \Drupal\services_autowire_example\AutowireExample
    autowire: true
```

Creating Services - Autowiring

- Alternatively, you can set a default in your service file that all services will be autowired.

```
services:
  _defaults:
    autowire: true

  services_autowire_example.autowire_example:
    class: \Drupal\services_autowire_example\AutowireExample
```

Creating Services - Autowiring

- Create your class as normal. The interfaces you nominate will be translated into services and automatically injected into your constructor.

```
namespace Drupal\services_autowire_example;

use Drupal\Core\Password\PasswordGeneratorInterface;

class AutowireExample implements AutowireExampleInterface {

  public function __construct(protected PasswordGeneratorInterface $passwordGenerator) {
  }

  public function generate12CharacterPassword():string {
    return $this->passwordGenerator->generate(12);
  }
}
```

Controllers And Forms

Controllers And Forms

- Some types of Drupal object (especially Controllers and Forms) don't use `*.services.yml` files.
- Instead they implement

```
\Drupal\Core\DependencyInjection\ContainerInjectionInterface
```

- Drupal will see this and use a method called `create()` in the class to create the service.
- The `create()` method must return an instance of the service object.

Controllers And Forms

- Best practice is to assign the properties you need in the `create()` method.

```
class ControllerExample extends ControllerBase {

  protected $passwordGenerator;

  public static function create(ContainerInterface $container) {
    $instance = new static();
    $instance->passwordGenerator = $container->get('password_generator');
    return $instance;
  }

  /// ..
}
```

Plugins

- Plugins have a similar interface called

```
\Drupal\Core\Plugin\ContainerFactoryPluginInterface
```

- This has the same `create()` method system, although you need to pass the plugin arguments to the parent constructor.

Plugins

- The plugin constructor does need to receive arguments for plugins.

```
public static function create(ContainerInterface $container,
  array $configuration,
  $plugin_id,
  $plugin_definition
) {
  $instance = new static($configuration, $plugin_id, $plugin_definition);
  $instance->passwordGenerator = $container->get('password_generator');
  return $instance;
}
```

Hook Service Classes

Hook Service Classes

- New in Drupal 11.1.0!
- Procedural hooks are being replaced by an OOP approach.
- Built using services.
- Not all hooks are being replaced. For example:
  - `hook_install()` `hook_update_N()`
  - `hook_preprocess_HOOK()`
- See https://www.drupal.org/node/3442349

Hook Service Classes

- Define the service to put our hooks in.

```
services:
  services_hooks_example.node_hooks:
    class: \Drupal\services_hooks_example\Hook\NodeHooks
    autowire: true
```

Hook Service Classes

- Define our hooks using PHP attributes.

```php
namespace Drupal\services_hooks_example\Hook;

use Drupal\Core\Hook\Attribute\Hook;
use Drupal\node\NodeInterface;

class NodeHooks {
  /**
   * Implements hook_ENTITY_TYPE_insert() for node entities.
   */
  #[Hook('node_insert')]
  public function nodeInsert(NodeInterface $node) {
    // Act on the hook being triggered.
  }
}
```

Hook Service Classes

- For the time being, you are encouraged to add a shim procedural hook in the usual place.

```
use Drupal\node\NodeInterface;

#[LegacyHook]
function services_hooks_example_node_insert(NodeInterface $node) {
  \Drupal::service('services_hooks_example.node_hooks')->nodeInsert($node);
}
```

Hook Service Classes

- If you have no legacy hooks then you can improve performance by setting this parameter in your *.services.yml file.

```
parameters:
  services_hooks_example.hooks_converted: true
```

Tagged Services

Tagged Services

- Some services can be tagged.
- This gives them special abilities.
- Listening to events, controlling access, set up caching, etc.

Tagged Services - Events

- The simplest tagged service is the event subscriber.
- This service will be triggered when events happen.

```
services:
  eventsubscriber_example.eventlistner_service:
    class: \Drupal\eventsubscriber_example\EventSubscriber\EventListenerService
    tags:
      - { name: event_subscriber }
```

Tagged Services - Events

```php
namespace Drupal\eventsubscriber_example\EventSubscriber;

use Symfony\Component\EventDispatcher\EventSubscriberInterface;
use Symfony\Component\HttpKernel\Event\RequestEvent;
use Symfony\Component\HttpKernel\KernelEvents;

class EventListenerService implements EventSubscriberInterface {

  public function onRequest(RequestEvent $event) {
    // Runs when a request is made.
  }

  public static function getSubscribedEvents(): array {
    return [KernelEvents::REQUEST => [['onRequest', 1]]];
  }
}
```

Tagged Services - Autoconfigure

- Use the `autoconfigure: true` directive to automatically tag classes.

```
services:
  _defaults:
    autoconfigure: true
  services_autoconfigure_example.autoconfigured_service:
    class: \Drupal\services_autoconfigure_example\EventSubscriber\AutoconfiguredService
```

- For events, Drupal looks for services that implement \Symfony\Component\EventDispatcher\EventSubscriberInterface

Tips For Creating Services

Tips For Creating Services

- Don't use `\Drupal::service()` inside your service classes, use dependency injection instead.
- Use **SOLID** principles. Create small service classes that perform one task.
- Don't have services with lots of arguments. This tends to show that the service is doing too much.
- Keep constructors as simple as possible. Just assign your dependencies to properties.

Tips For Creating Services

- Don't "hand off" dependencies to internal classes, use additional services.
- Consider not creating a service if the class has no dependencies.
- If you need to alter the class at runtime then make a service to allow Drupal to do that.

Altering Services

Altering Services

- All services can be modified to change their funcitonality.
- This can be done in two ways, depending on your needs:
  - Decorating
  - Altering

Altering Services: Decorating

- Services can be decorated to create your own service that extends another service.
- The original service will still exist, but you will have a new service that accepts the same arguments.

```
services:
  services_decorator_example.decorated_password_generator:
    class: \Drupal\services_decorator_example\DecoratedPasswordGenerator
    decorates: password_generator
```

Altering Services: Decorating

- We just extend the original class.

```php
<?php

namespace Drupal\services_decorator_example;

use Drupal\Core\Password\DefaultPasswordGenerator;

/**
 * Decorates the DefaultPasswordGenerator class.
 */
class DecoratedPasswordGenerator extends DefaultPasswordGenerator {

  protected $allowedChars = 'abcdefghijkmnopqrstuvwxyz';

}
```

Altering Services: Altering

- Override the serivce completely and replace it with your own.
- Create a class that has the name `[ModuleName]ServiceProvider`, which extends the class `\Drupal\Core\DependencyInjection\ServiceProviderBase`
- Drupal will pick up this class and run the `register()` and `alter()` methods.

Altering Services: Altering

- Altering services is especially powerful when integrating with an external API.
- You can stub or mock the external API so that you can run tests using a known subset of data.
- Also useful if you API restricted and not everyone has access to it.

Altering Services: Altering

- The Joke API (https://sv443.net/jokeapi/v2/) is a free API that returns Jokes.
- Joke API service wraps the API so we can call it.

```
services:
  joke_api.joke:
    class: Drupal\joke_api\JokeApi
    autowire: true
```

Altering Services: Altering

- The `joke_api.joke` service calls the API and returns a joke.

```
namespace Drupal\joke_api;

use GuzzleHttp\Client;

class JokeApi implements JokeApiInterface {

 protected $url = 'https://v2.jokeapi.dev/joke/';

 public function __construct(protected ClientInterface $httpClient) {}

 public function getJoke() {
   $request = $this->httpClient->request('GET', $url);
   return json_decode($request->getBody()->getContents());
 }
```

Altering Services: Altering

- To alter this service we need to create a module called `joke_api_stub`.
- We then add a class called `JokeApiStubServiceProvider` that extends `ServiceProviderBase`.

Altering Services: Altering

- The `alter()` method is can be used to alter an existing service.

```
namespace Drupal\joke_api_stub;

use Drupal\Core\DependencyInjection\ContainerBuilder;
use Drupal\Core\DependencyInjection\ServiceProviderBase;

class JokeApiStubServiceProvider extends ServiceProviderBase {
  public function alter(ContainerBuilder $container) {
    // Replace the \Drupal\joke_api\JokeApi class with our own stub class.
    $definition = $container->getDefinition('joke_api.joke');
    $definition->setClass('Drupal\joke_api_stub\JokeApiStub');
  }
}
```

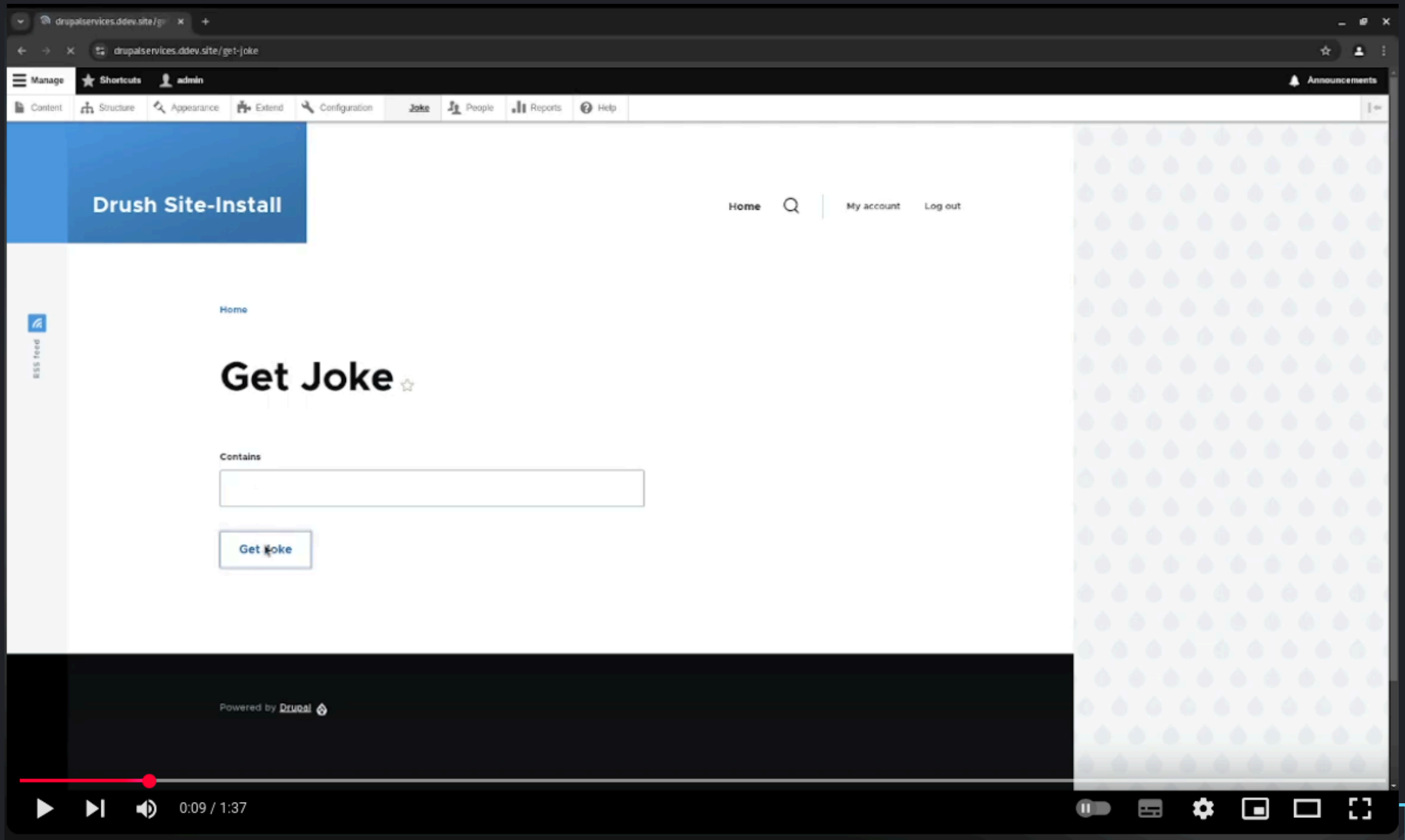
Altering Services: Altering

```
namespace Drupal\joke_api_stub;

use Drupal\joke_api\JokeApi;

class JokeApiStub extends JokeApi {

  public function getJoke() {
    $data = '{
    "error": false,
    "category": "Programming",
    "type": "twopart",
    "setup": "A web developer walks into a restaurant.",
    "delivery": "He immediately leaves in disgust as the restaurant was laid out in tables.",
    "flags": {
        "nsfw": false,
        "religious": false,
        "political": false,
        "racist": false,
        "sexist": false,
        "explicit": false
    },
    "id": 6,
    "safe": true,
    "lang": "en"
    }';
    return json_decode($data);
  }
}
```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Manage
Shortcuts
admin
Announcements
Content
Structure
Appearance
Extend
Configuration
Joke
People
Reports
Help
Drush Site-Install
Home
My account
Log out
RSS feed
Home
Get Joke
Contains
Get Joke
Powered by Drupal
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Next Steps

There's much more to Drupal services, try looking up

- Access control services
- Factories
- Lazy services
- Public and private services
- Service aliases

Resources

- Services and DI on `#! code`
  www.hashbangcode.com/tag/dependency-injection
- Custom code seen is code available at
  https://github.com/hashbangcode/drupal_services_example
- Joke API available at
  https://github.com/hashbangcode/joke_api

Resources

- Services and Dependency Injection - https://www.drupalatyourfingertips.com/services
- Structure of a service file https://bit.ly/4hOh1ZT

Questions?

- Slides: https://github.com/hashbangcode/drupal-services-talk

Thanks!

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