Introduction to Apigility

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Nineteen Feet

Development : Training : Consultancy

http://19ft.com

APIs are becoming commonplace

APIs are hard

API considerations

Content negotiation	HTTP method negotiation
Error reporting	Versioning
Discovery	Validation
Authentication	Authorisation
Documentation	

An opinionated API builder

(Screencast: Hello World)

Apigility

- Administration system
- Runtime API engine
- PHP, built on Zend Framework 2

Versioning by default

Media type:

```
GET /albums HTTP/1.1
Accept: application/vnd.music.v1+json
```

URL-based:

```
/v1/albums
```

JSON

Hypermedia Application Language (HAL) - application/hal+json

```
{
    "_links": {
        "self": {
            "href": "http://localhost:8080/albums/1"
        }
    },
    "artist": "Eninem",
    "id": "1",
    "title": "The Marshall Mathers LP 2"
}
```

Error Reporting

API Problem - application/problem+json

```
{
    "type": "/api/problems/forbidden",
    "title": "Forbidden",
    "detail": "Your API key is missing or invalid.",
    "status": 403,
    "authenticationUrl": "/api/oauth"
}
```

HTTP features

- Method negotiation
- Accept checking
- Content-Type acceptance
- Automatic OPTIONS

Validation

```
PATCH /albums/1 HTTP/1.1
Content-Type: application/json

{ "title": "" }
```

```
422 Unprocessable Entity
Content-Type: application/problem+json

{
  "type": "w3.org/Protocols/rfc2616/rfc2616-sec10.html",
  "title": "Unprocessable Entity",
  "detail": "Failed validation",
  "status": 422,
  "validation_messages": {
      "title": "Invalid title; must be a non-empty string"
  }
}
```

Authentication

- HTTP Basic and Digest (for internal APIs)
- OAuth2 (for public APIs)
- Event-driven, to accommodate anything else
- Returns problem response early
- Correct errors: 401, 403, etc.

Hyperlinking: Pagination

Automatic when you use `Zend\Paginator\Paginator`.

```
{
    _links: {
        self: { href: "/api/albums?page=3" },
        first: { href: "/api/albums" },
        last: { href: "/api/albums?page=14" },
        prev: { href: "/api/albums?page=2" },
        next: { href: "/api/albums?page=4" }
    }
}
```

Documentation

- Written within admin while setting up API
- Automatically populated via validation admin
- User documentation:
    - apigility/documentation/{API name}/V1
    - JSON or HTMl based on accept header
    - Swagger available too

Let’s see it in action!

Getting Started

Install:

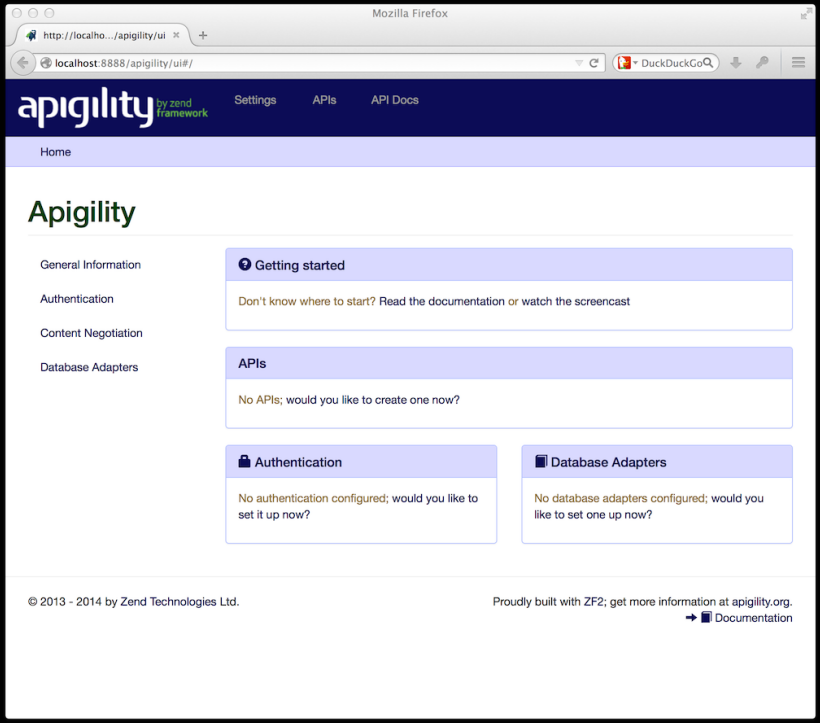
```
$ composer.phar create-project \
  -sdev zfcampus/zf-apigility-skeleton music
```

Development Mode:

```
$ cd music
$ php public/index.php development enable
```

Run the admin web UI:

```
$ php -S 0:8080 -t public/ public/index.php
```


Mozilla Firefox
http://localho.../apigility/ui
localhost:8888/apigility/ui#/
DuckDuckGo
apigility by zend framework
Settings
APIs
API Docs
Home
Apigility
General Information
Authentication
Content Negotiation
Database Adapters
Getting started
Don't know where to start? Read the documentation or watch the screencast
APIs
No APIs; would you like to create one now?
Authentication
No authentication configured; would you like to set it up now?
Database Adapters
No database adapters configured; would you like to set one up now?
© 2013 - 2014 by Zend Technologies Ltd.
Proudly built with ZF2; get more information at apigility.org.
Documentation

(Screencast: Create a REST API)

Test with curl

```
$ curl -s -H "Accept: application/vnd.music.v1+json" \
  http://localhost:8080/albums | python -mjson.tool

{
  "detail": "The GET method has not been defined for
             collections",
  "status": 405,
  "title": "Method Not Allowed",
  "type": "w3.org/Protocols/rfc2616/rfc2616-sec10.html"
}
```

Source code

Apigility has created a module called `Music` for our API.

The `Album` endpoint is in: `src/Music/V1/Rest/Album`

Classes:

`AlbumResource`	entry point to service
`AlbumCollection`	a collection of albums
`AlbumEntity`	a single album

AlbumResource class

Methods for the collection: `/albums`

Class method	HTTP	Notes
`fetchAll`	GET	retrieve all items
`create`	POST	create an item
`replaceList`	PUT	replace all items
`deleteList`	DELETE	Delete all items

AlbumResource class

Methods for a single resource: `/albums/[album_id]`

Class method	HTTP	Notes
`fetch`	GET	retrieve an item
`patch`	PATCH	update some fields
`update`	PUT	replace an item
`delete`	DELETE	delete an item

The data model

```
class AlbumEntity
{
    protected $id;
    protected $artist;
    protected $title;
}

class AlbumMapper
{
  public function fetchAll($filter) { /* .. */ }
  public function fetchOne($id) { /* .. */ }
  public function save($album) { /* .. */ }
}
```

Fetching the collection

```php
class AlbumResource extends AbstractResourceListener
{
  public function fetchAll($params = array())
  {
    // return an AlbumCollection
    return $this->mapper->fetchAll($params);
  }
}
```

Test:

```
$ curl -s -H "Accept: application/vnd.music.v1+json" \
  http://localhost:8080/albums?title=night \
  | python -mjson.tool
```

Fetching the collection


```
{
    "_embedded": {
        "album": [
            {
                "_links": {
                    "self": { "href": "http://localhost:8080/albums/4" }
                },
                "artist": "Andre Rieu",
                "id": "4",
                "title": "Music of the Night"
            }
        ]
    },
    "_links": {
        "first": { "href": "http://localhost:8080/albums" },
        "last": { "href": "http://localhost:8080/albums?page=1" },
        "self": { "href": "http://localhost:8080/albums?page=1" }
    },
    "page_count": 1,
    "page_size": 25,
    "total_items": 1
}
```

Fetching a single resource

```
class AlbumResource extends AbstractResourceListener
{
  public function fetch($id)
  {
    // return an AlbumEntity
    return $this->mapper->fetchOne($id);
  }
}
```

Test:

```
$ curl -s -H "Accept: application/vnd.music.v1+json" \
  http://localhost:8080/albums/1 | python -mjson.tool
```

Response


```
{
    "_links": {
        "self": {
            "href": "http://localhost:8080/albums/1"
        }
    },
    "artist": "Eninem",
    "id": "1",
    "title": "The Marshall Mathers LP 2"
}
```

Creating a resource

```php
public function create($data)
{
  // return an AlbumEntity
  return $this->mapper->save($data);
}
```

POST to the collection

```
$ curl -s -X POST -H "Content-type: application/json" \
  -H "Accept: application/vnd.music.v1+json"  \
  -d '{"title":"True", "artist":"Avicii"}' \
  http://localhost:8080/albums |  python -mjson.tool
```

Response

Header:

```
HTTP/1.1 201 Created
Location: http://localhost:8080/albums/7
```

Body:

```
{
    "_links": {
        "self": {
            "href": "http://localhost:8080/albums/7"
        }
    },
    "artist": "Avicii",
    "id": "7",
    "title": "True"
}
```

Updating a resource

```php
public function update($id, $data)
{
  // return an AlbumEntity
  return $this->mapper->save($data, $id);
}
```

PUT to the resource

```
$ curl -s -X PUT -H "Content-type: application/json" \
  -H "Accept: application/vnd.music.v1+json"  \
  -d '{"title":"True!", "artist":"Avicii"}' \
  http://localhost:8080/albums/7 |  python -mjson.tool
```

Response

Header:

```
HTTP/1.1 200 OK
```

Body:

```
{
    "_links": {
        "self": {
            "href": "http://localhost:8080/albums/7"
        }
    },
    "artist": "Avicii",
    "id": "7",
    "title": "True!"
}
```

Validation

- Built into the Apigility admin
- Tested when routing: very fast to fail

(Screencast: Validation)

Validation

POST with an an empty artist to the collection

```
$ curl -s -X POST -H "Content-type: application/json" \
  -H "Accept: application/vnd.music.v1+json"  \
  -d '{"title":"Greatest Hits", "artist":""}' \
  http://localhost:8080/albums |  python -mjson.tool
```

Response

Header:

```
HTTP/1.1 422 Unprocessable Entity
```

Body:


```
{
    "detail": "Failed Validation",
    "status": 422,
    "title": "Unprocessable Entity",
    "type": "http://www.w3.org/Protocols/rfc2616/rfc2616-sec10.html",
    "validation_messages": {
        "artist": {
            "isEmpty": "Value is required and can't be empty"
        }
    }
}
```

To sum up

Apigility provides the boring bits of API building:

- Content negotiation
- Discovery (HATEOS) via application/hal+json
- Error reporting via application/problem+json
- Versioning
- Validation
- Authentication
- Documentation

Thank you!

https://joind.in/talk/view/11732

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