

# Swagger driven REST API development with the Falcon web server



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PyCon Brisbane 2015

# About me.

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- Melbourne based
- Python developer, Linux, AWS, learning ReactJS
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# Questions for the audience.

- Who has:
- heard of / used Swagger?
- heard of / used Falcon?
- written a REST back end?
- interfaced to a REST back end?

# www.SinglePage.Guru problems

- I developed the Python back-end, a friend developed the JavaScript front end
- My poorly defined API led to frustration, bugs and wasted time
- The site is not there any more.....

# My next project: Mailman 3



- I wanted to do Mailman 3 development, but an authenticating proxy server was needed
- Damned if I'm going back to undefined API hell.
- Time to document! Swagger looked right for the job.

# Without an API doc, you're in the dark!

- Why document your REST API?
- Saves the time of developers, testers, BA's trying to find how an API works
- JSON API doc becomes central point of authority
- JSON API doc can be used to create clients
- JSON API doc can be used to create servers
- JSON API doc can be used to create tests

# Why Swagger?




- A specification for documenting API's as JSON
- Can be static or dynamic
- Comes with a great API browser
- Seems to have market momentum

# Mailman API in Swagger

- Mailman API documented well, but must be extracted from documentation and source code
- Was a big exercise to pull all the information into Swagger file
- Once done, development could start
- <http://supercoders.com.au/swagger-ui/dist/index.html>



→ ↺ 🏠 📄 supercoders.com.au/swagger-ui/dist/index.html ☆

 **swagger**

**Explore**

# Mailman 3 REST API


Mailman 3 REST API

Created by Developers  
See more at <http://www.gnu.org/software/mailman/>  
[Contact the developer](#)  
[Gnu GPL](#)

<b>addresses</b>	Show/Hide	List Operations	Expand Operations
<b>apidocs</b>	Show/Hide	List Operations	Expand Operations
<b>domains</b>	Show/Hide	List Operations	Expand Operations
<b>lists</b>	Show/Hide	List Operations	Expand Operations
<b>members</b>	Show/Hide	List Operations	Expand Operations
<b>queues</b>	Show/Hide	List Operations	Expand Operations
<b>system</b>	Show/Hide	List Operations	Expand Operations
<b>users</b>	Show/Hide	List Operations	Expand Operations

[ BASE URL: /api/3.0 , API VERSION: 3.0 ]

INVALID



# Mailman 3 REST API

Mailman 3 REST API

Created by Developers

See more at <http://www.gnu.org/software/mailman/>

[Contact the developer](#)

[Gnu GPL](#)

## addresses

Show/Hide | List Operations | Expand Operations

GET	/addresses	Get all addresses
DELETE	/addresses/{email}	Delete an address
GET	/addresses/{email}	Get an address
DELETE	/addresses/{email}/user	Unlink the linked user from the address
GET	/addresses/{email}/user	Get the linked user for the address
POST	/addresses/{email}/user	Link an address to a user
PUT	/addresses/{email}/user	Link an address to a different user

GET /addresses

Get all addresses

DELETE /addresses/{email}

Delete an address

## Implementation Notes

Delete an address

## Response Class (Status 200)

Model | Model Schema

```
[
  {
    "base_url": "string",
    "contact_address": "string",
    "description": "string",
    "mail_host": "string",
    "self_link": "string",
    "url_host": "string"
  }
]
```

Response Content Type

## Parameters

Parameter	Value	Description	Parameter Type	Data Type
email	<input type="text" value="(required)"/>	email	path	string

## Response Messages

HTTP Status Code	Reason	Response Model	Headers
400	Invalid status value		

Try it out!

```
        "url": "http://www.gnu.org/software/mailman/"
    },
    "license": {
        "name": "Gnu GPL",
        "url": "http://www.gnu.org/copyleft/gpl.html"
    }
},
"host": "www.mailripper.com",
"schemes": [...],
"basePath": "/api/3.0",
"consumes": [...],
"produces": [...],
"paths": {
    "/addresses": {...},
    "/addresses/{email}": {...},
    "/addresses/{email}/user": {...},
    "/addresses/{email}/verify": {...},
    "/addresses/{email}/unverify": {...},
    "/addresses/{email}/preferences": {...},
    "/addresses/{email}/memberships": {...},
    "/api-docs.json": {...},
    "/domains": {...},
    "/domains/{domain}": {...},
    "/domains/{domain}/lists": {...},
    "/domains/{domain}/owners": {...},
    "/lists": {...},
    "/lists/styles": {...},
    "/lists/{list_id}": {...},
    "/lists/{list_id}/archivers": {...},
    "/lists/{list_id}/config": {...},
    "/lists/{list_id}/config/{sub_resource}": {...},
    "/lists/{list_id}/held": {...}
}
```





```

/system/preferences": {...},
"/system/configuration": {...},
"/system/configuration": {...},
"/users": {
  "get": {"summary": "Get list of users"...},
  "post": {
    "tags": [
      "users"
    ],
    "summary": "Creates a new user",
    "description": "Creates a new user",
    "operationId": "UsersPOST",
    "consumes": [
      "application/x-www-form-urlencoded"
    ],
    "produces": [
      "application/json"
    ],
    "parameters": [
      {
        "name": "email",
        "in": "formData",
        "type": "string",
        "description": "email",
        "required": true
      }
    ]
  }
},

```



# Are you still listening?



A rabbit with a pancake on its head.

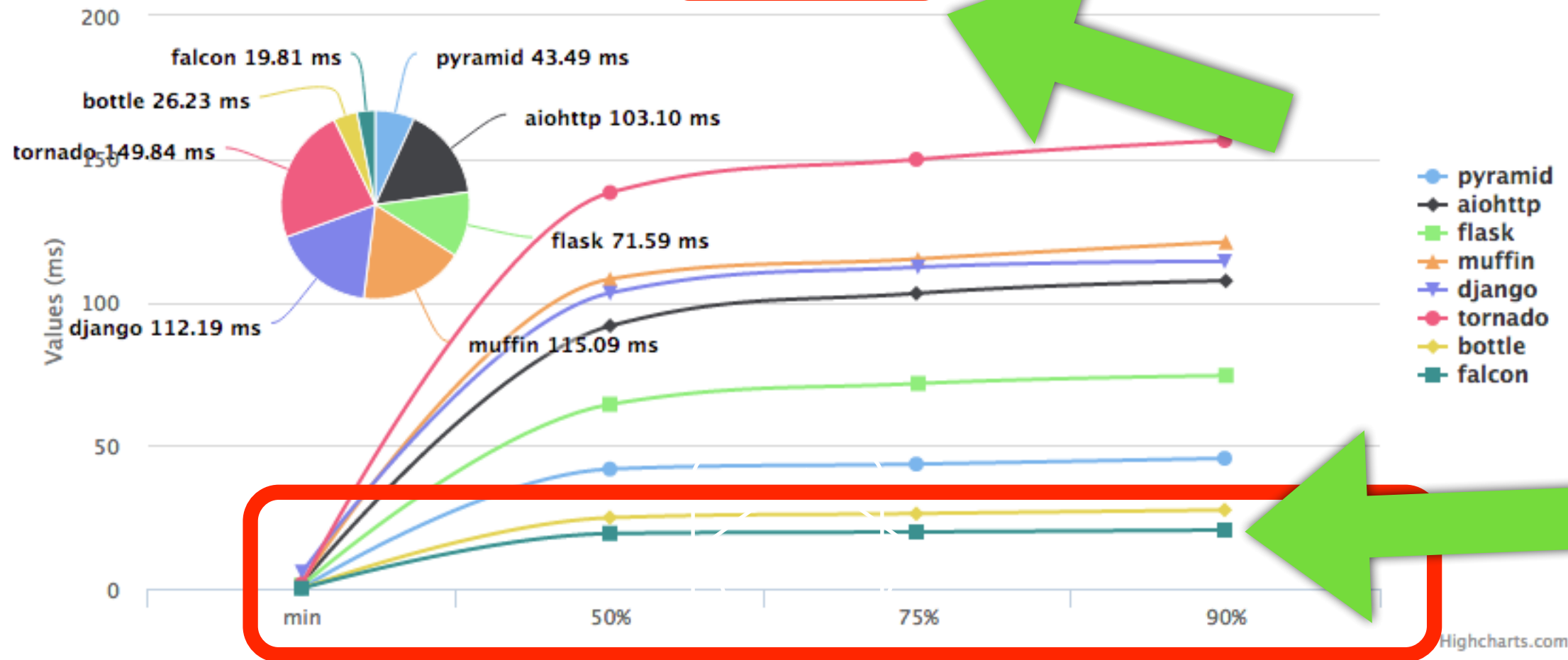
# Why Falcon?



- Python web server with minimalist philosophy
- Ideal for REST API development
- Used in Mailman 3 REST API
- Quite fast

## Encode a object to JSON and return as response

lower is better



Name	50% (ms)	75% (ms)	Avg (ms)	Req/s	200	outs
Falcon	19.24	19.81	19.19	20677.13		
Bottle	24.77	26.23	25.06	15761.45		
Pyramid	41.75	43.49	41.63	9402.69		
Flask	64.32	71.59	65.68	6023.4		

<http://klen.github.io/py-frameworks-bench/>



# The solution

- Why go and hard code all those routes into the source code?
- Pull the routes out of the Swagger JSON
- Map them to Python functions
- Instant REST API!

Code demo

# Links & contact

- [andrew.stuart@supercoders.com.au](mailto:andrew.stuart@supercoders.com.au)
- [https://github.com/crowdwave/serve\\_swagger](https://github.com/crowdwave/serve_swagger)
- Mailman authenticating proxy server
- <https://gitlab.com/astuart/mailmania>
- Swagger <http://swagger.io/>
- Falcon <http://falconframework.org/>