



A Babel Fish from the Swamp of POX

QCon NYC

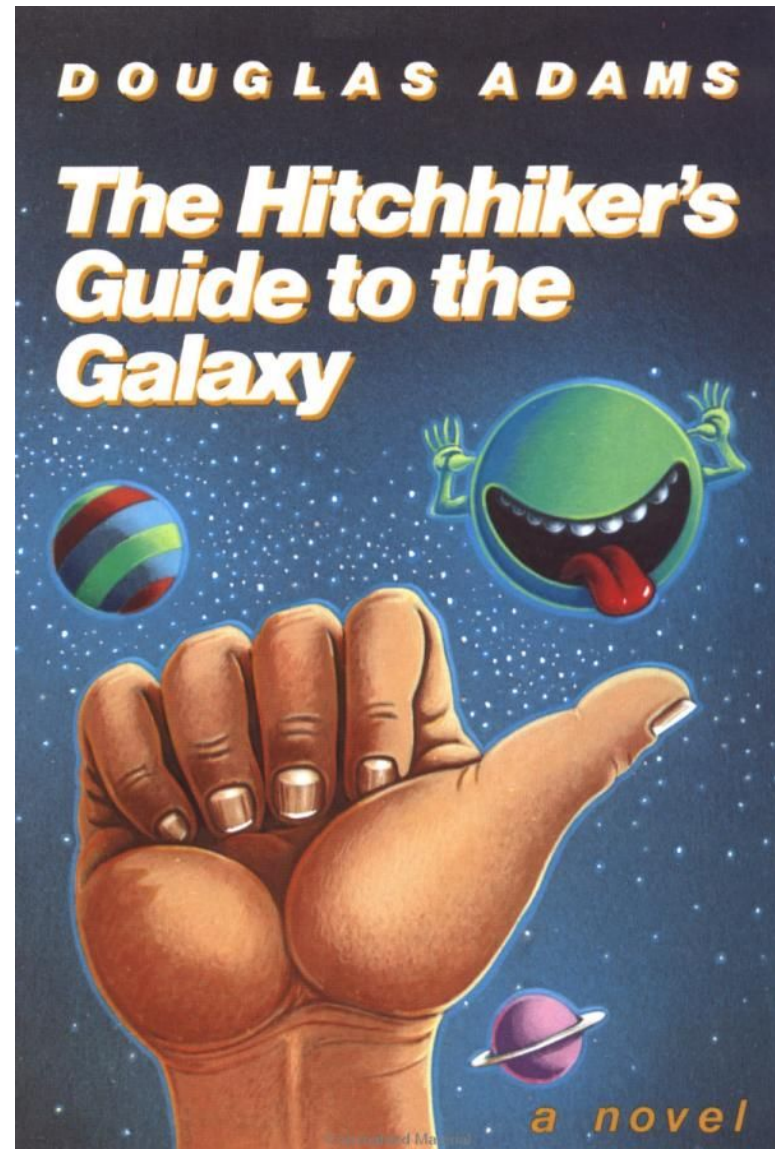
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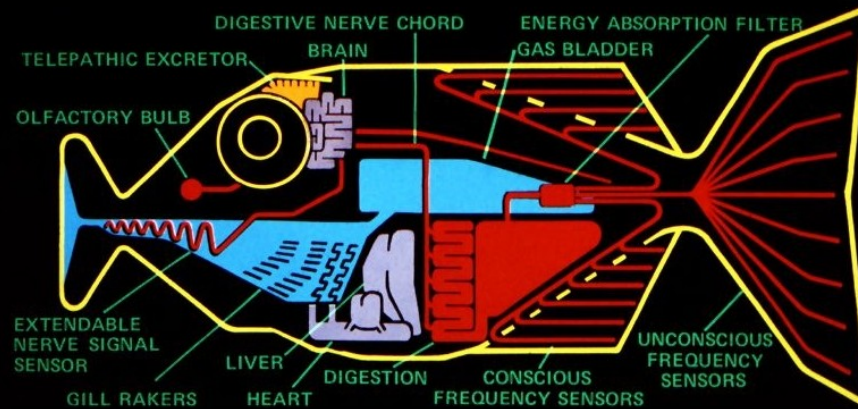
June 11th, 2015

A Babel Fish?



A Babel Fish?

The Babel Fish



The Babel fish is small, yellow, leech-like, and probably the oddest thing in the universe. It feeds on brain wave energy, absorbing all unconscious frequencies and then excreting telepathically a matrix formed from the conscious frequencies and nerve signals picked up from the speech centres of the brain, the practical upshot of which is that if you stick one in your ear, you can instantly understand anything said to you in any form of language: the speech you hear decodes the brain wave matrix. It is a universal translator which simultaneously translates from one spoken language to another. It takes the brainwaves of the other body and what they are thinking then transmits the thoughts to the speech centres of the host's brain, the speech heard by the ear decodes the brainwave matrix. When inserted into the ear, its nutrition processes convert unconscious sound waves into conscious brain waves, neatly crossing the language divide between any species.

A Swamp of POX?

Glory of REST



Level 3: Hypermedia Controls

Level 2: HTTP Verbs

Level 1: Resources

Level 0: The Swamp of POX



<http://martinfowler.com/articles/richardsonMaturityModel.html>

Why are we here?

WorldWideWeb:

Proposal for a HyperText Project

T. Berners-Lee / CN, R. Cailliau / ECP

Abstract:

HyperText is a way to link and access information of various kinds as a web of nodes in which the user can browse at will. Potentially, HyperText provides a single user-interface to many large classes of stored information such as reports, notes, databases, computer documentation and on-line systems help. We propose the implementation of a simple scheme to incorporate several different servers of machine-stored information already available at CERN, including an analysis of the requirements for information access needs by experiments.

Introduction

The current incompatibilities of the platforms and tools make it impossible to access existing information through a common interface, leading to waste of time, frustration and obsolete answers to simple data lookup. There is a potential large benefit from the integration of a variety of systems in a way which allows a user to follow links pointing from one piece of information to another one. This forming of a web of information nodes rather than a hierarchical tree or an ordered list is the basic concept behind HyperText.

The Web

“We propose the implementation of a simple scheme to incorporate several different servers of machine-stored information already available.”

- Berners-Lee / Cailliau, 1990

The Web

“... web of nodes in which the user can browse at will.”

- Berners-Lee / Cailliau, 1990

HTTP...

Tell me what HTTP is?

(?)

Tell me what HTTP is?

Hypertext Transfer Protocol

Tell me what HTTP is?

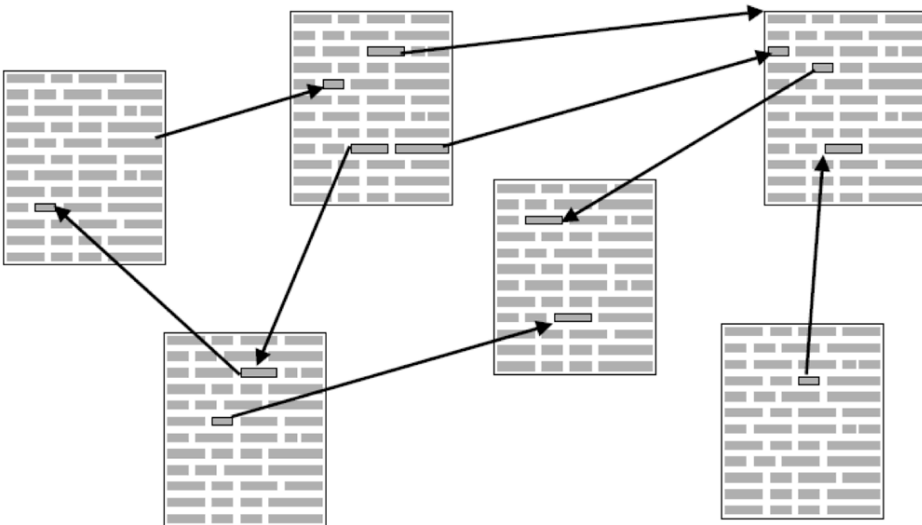
How-To-Transfer Protocol

????

HYPertext

Hypertext

Ted Nelson coins the word “*Hypertext in A File Structure for the Complex, the Changing, and the Indeterminate*”



**20th National Conference,
New York,
Association for Computing Machinery,
1965.**

Hypertext

Hypertext is text which contains links to other texts.

And by extension...

**HyperMedia is a term used for
hypertext which is not constrained
to be text**

Consider a Web Application

<http://www.facebook.com>

facebook

Email or Phone

ross.garrett@me.com

Keep me logged in

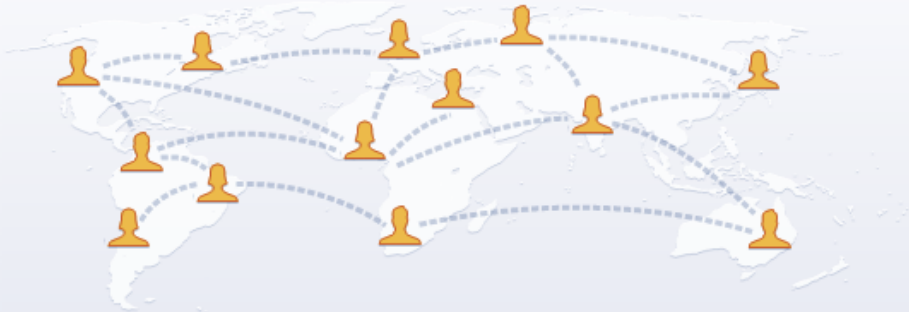
Password

.....

[Forgotten your password?](#)

Log In

Facebook helps you connect and share with the people in your life.



Create an account

It's free and always will be.

First name

Surname

Email or mobile number

Re-enter email or mobile number

New password

Birthday

Day Month Year

[Why do I need to provide my date of birth?](#)

Female Male

By clicking Create an account, you agree to our [Terms](#) and that you have read our [Data Policy](#), including our [Cookie Use](#).

The Web is more than just HTTP

The Web is more than just HTTP

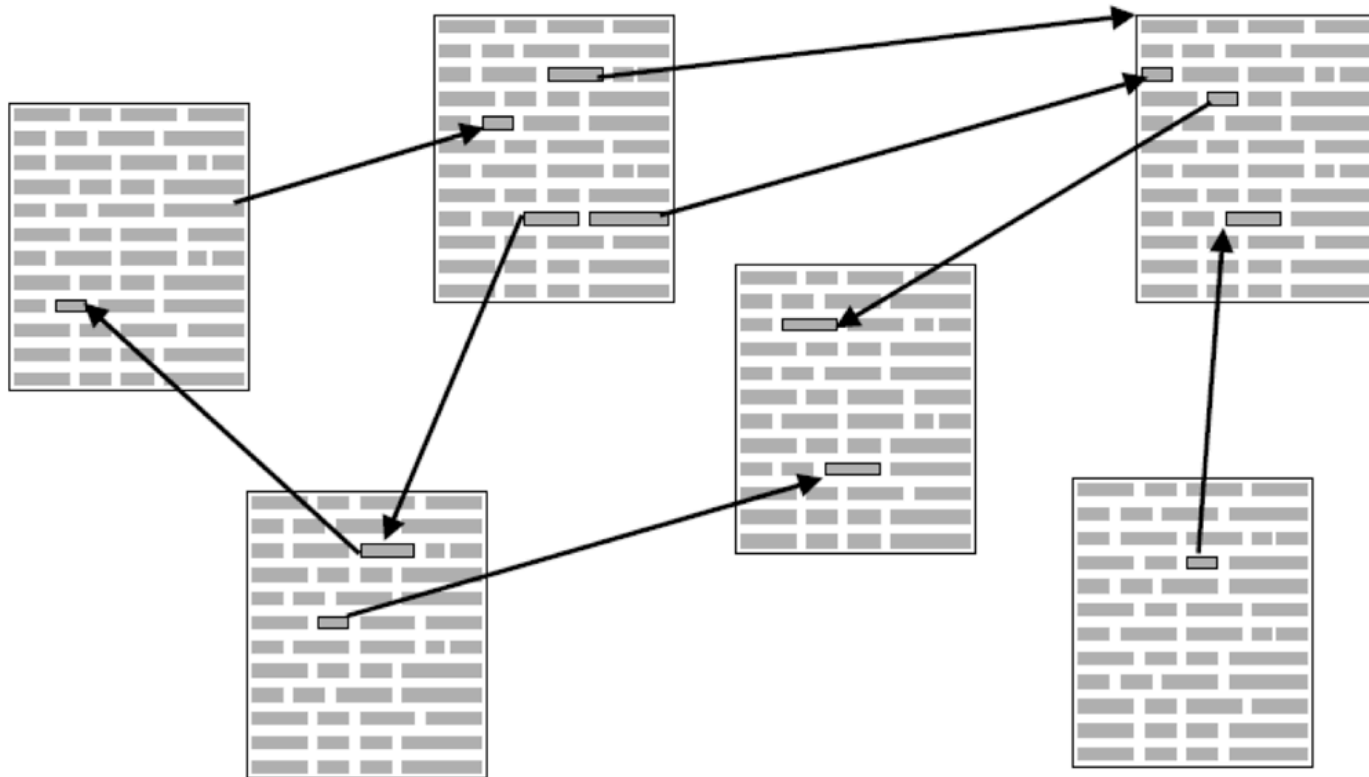
- HTTP
- URI
- HTML

We need to use ALL of the Web

But have we forgotten this in a World of APIs?

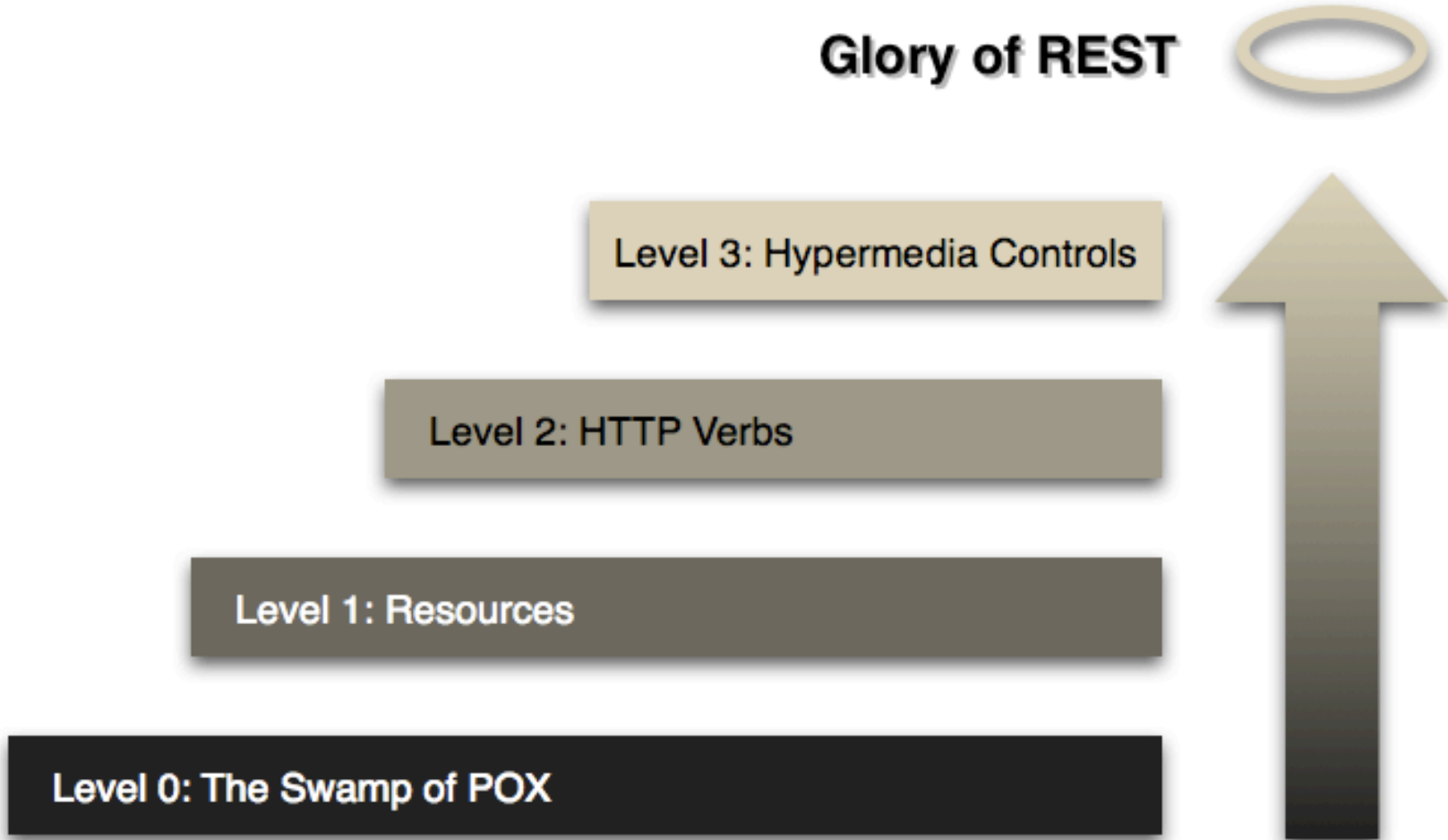
~~How-To-Transfer Protocol~~

The Web



A Reminder

Glory of REST



From the beginning then...



The Swamp of POX

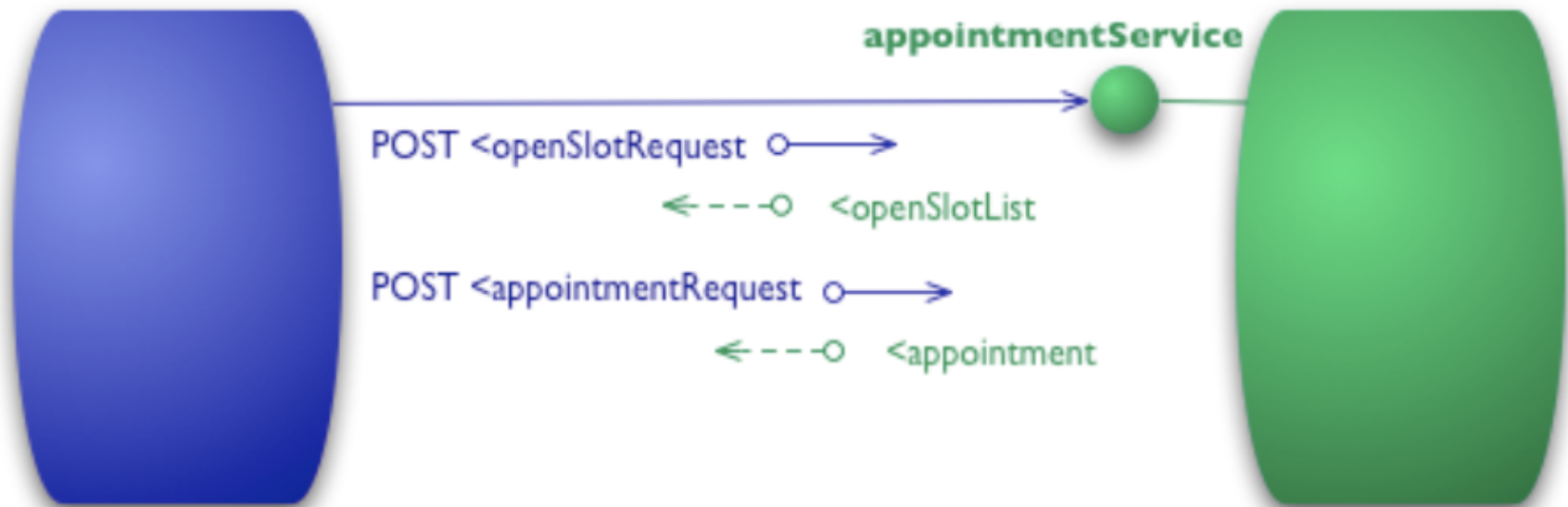
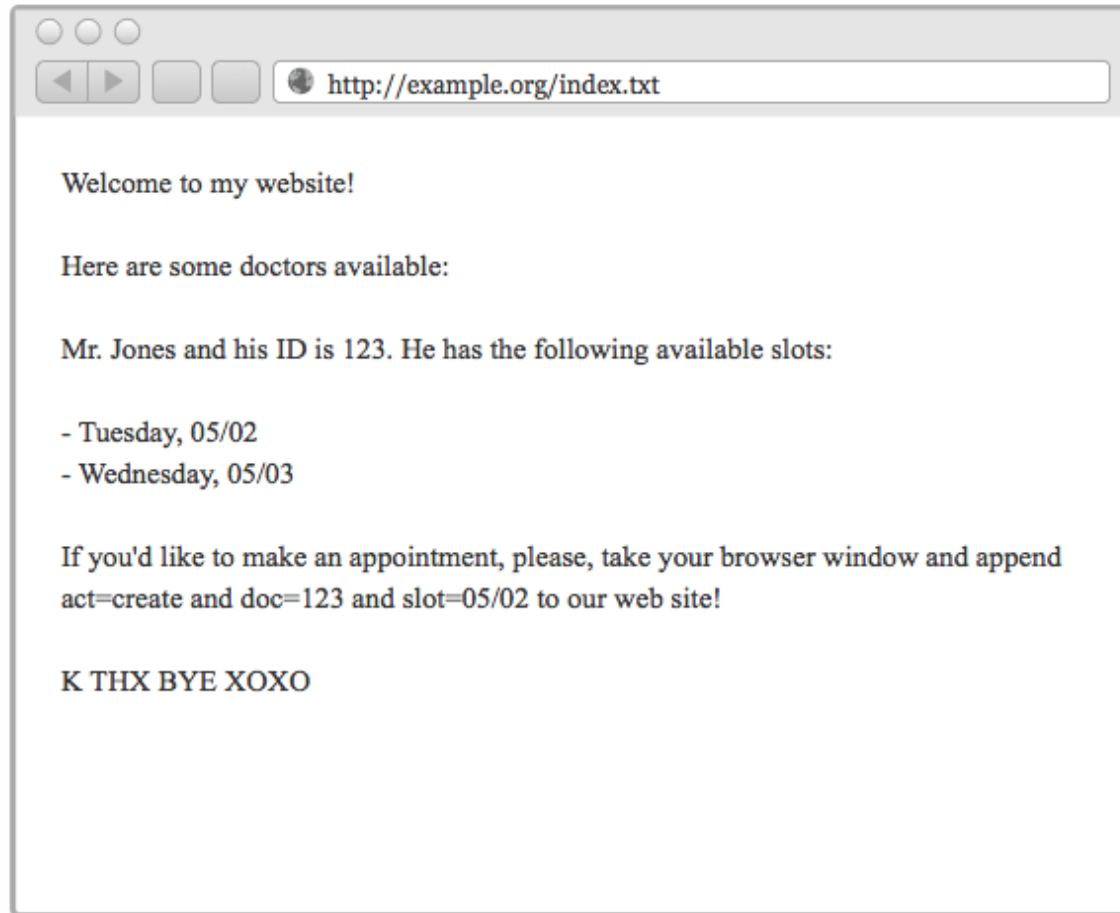


Figure 2: An example interaction at Level 0

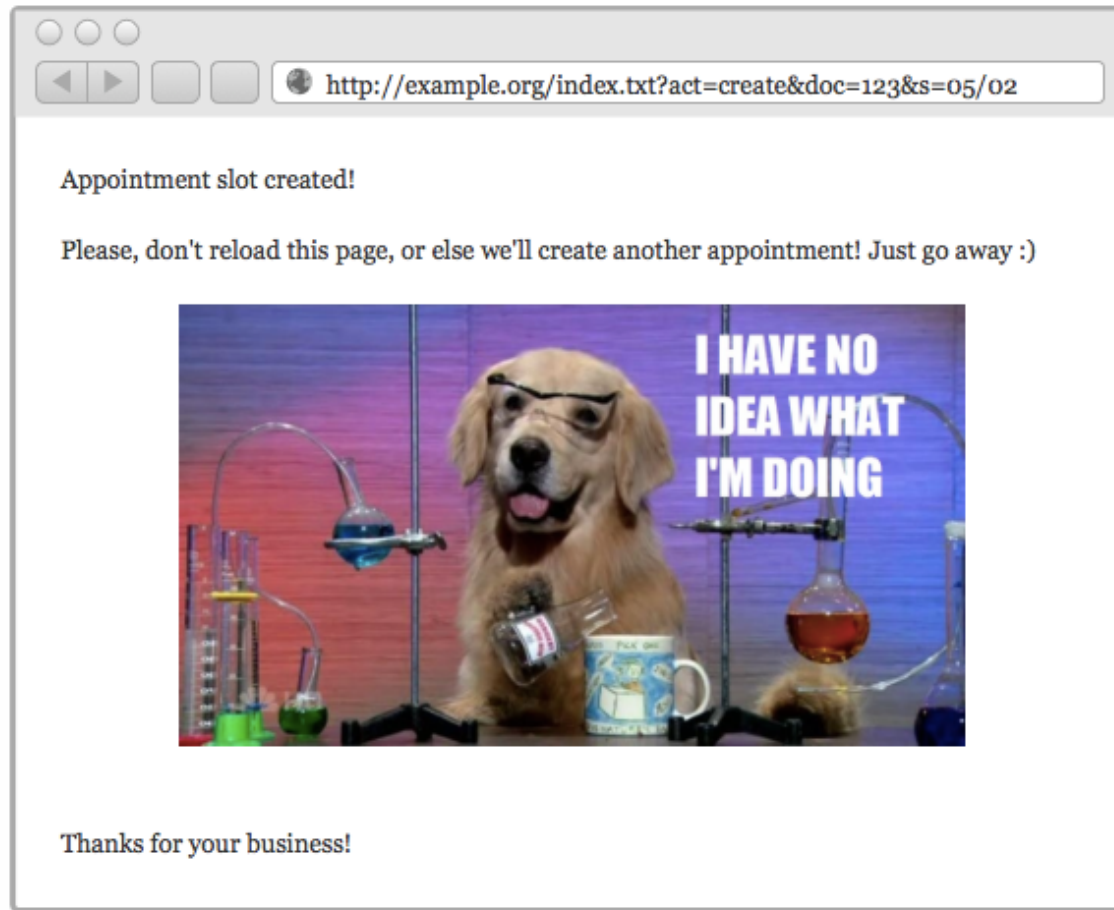
A example POX API

```
1. POST / HTTP/1.1
2. Host: www.example.org
3. Content-Type: application/soap+xml; charset=utf-8
4. Content-Length: 299
5. SOAPAction: "http://www.w3.org/2003/05/soap-envelope"
6. <?xml version="1.0"?>
7. <soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope">
8.   <soap:Body>
9.     <m:ScheduleAppointment xmlns:m="http://www.example.org/doctors">
10.       <m:DoctorId>123</m:DoctorId>
11.     </m:ScheduleAppointment>
12.   </soap:Body>
13. </soap:Envelope>
```

Looking at this as a Web Page



Looking at this as a Web Page



Level 1 - Resources

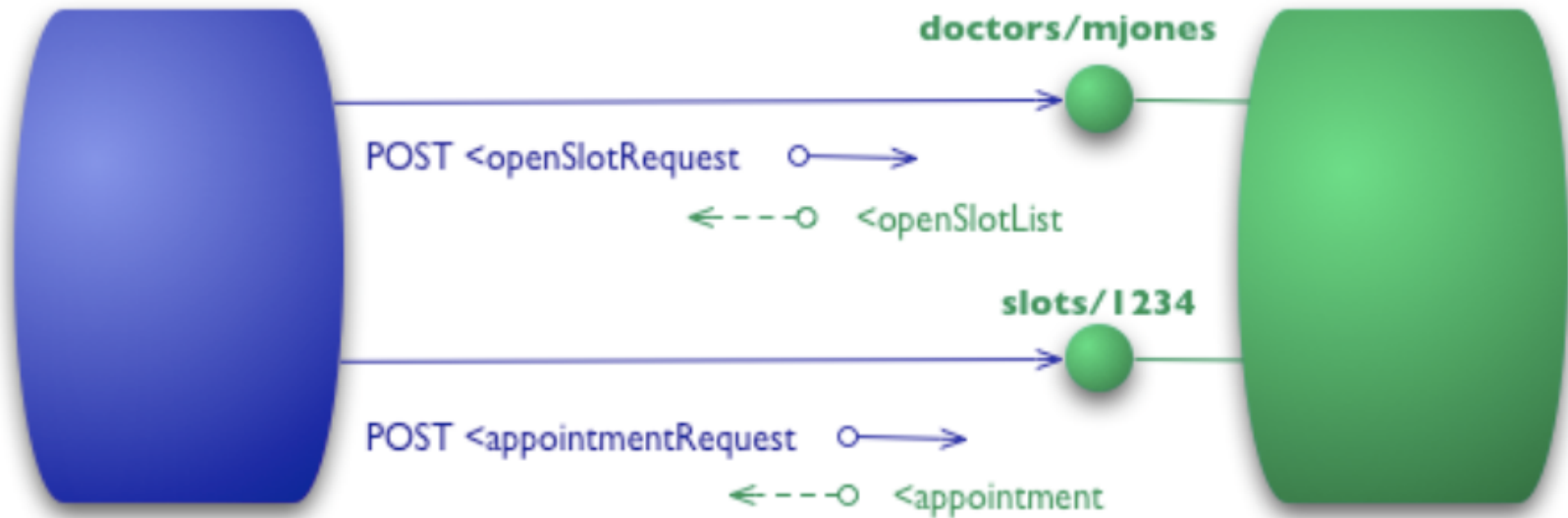
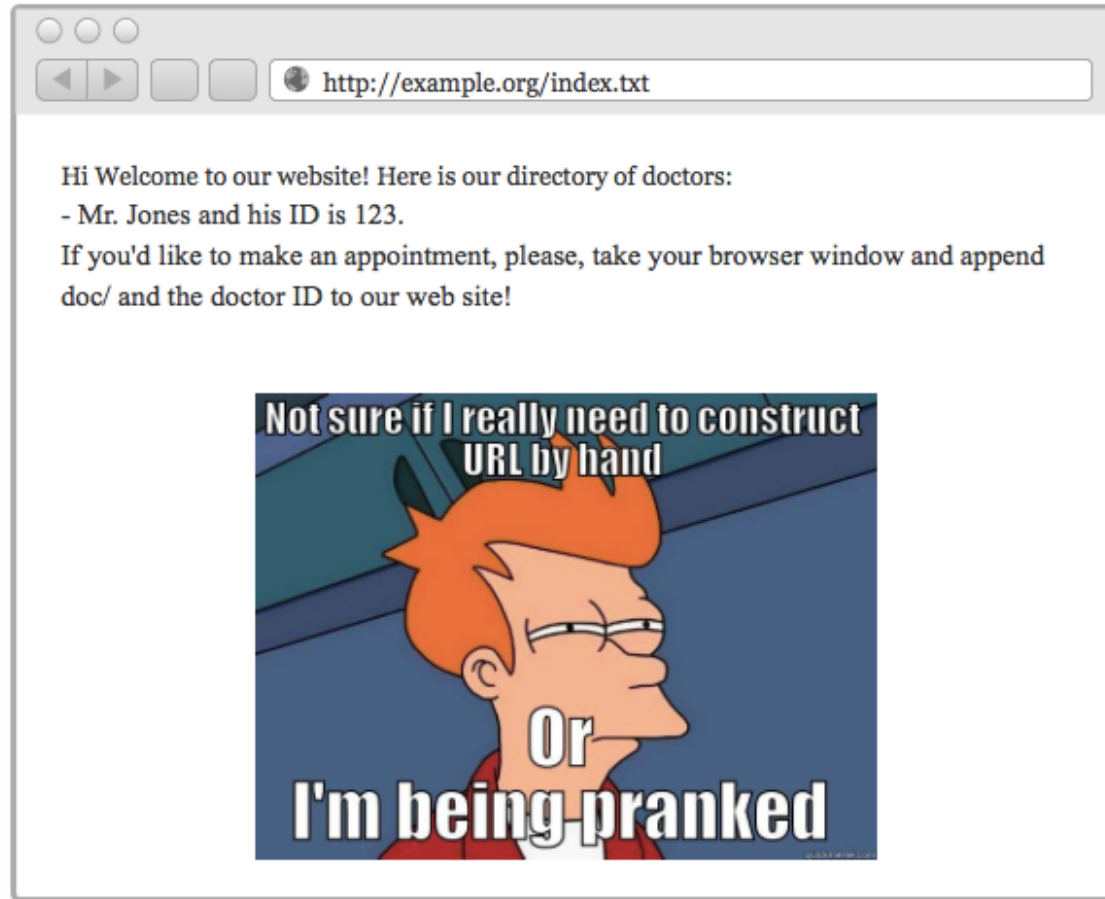


Figure 3: Level 1 adds resources

An example Level 1 API

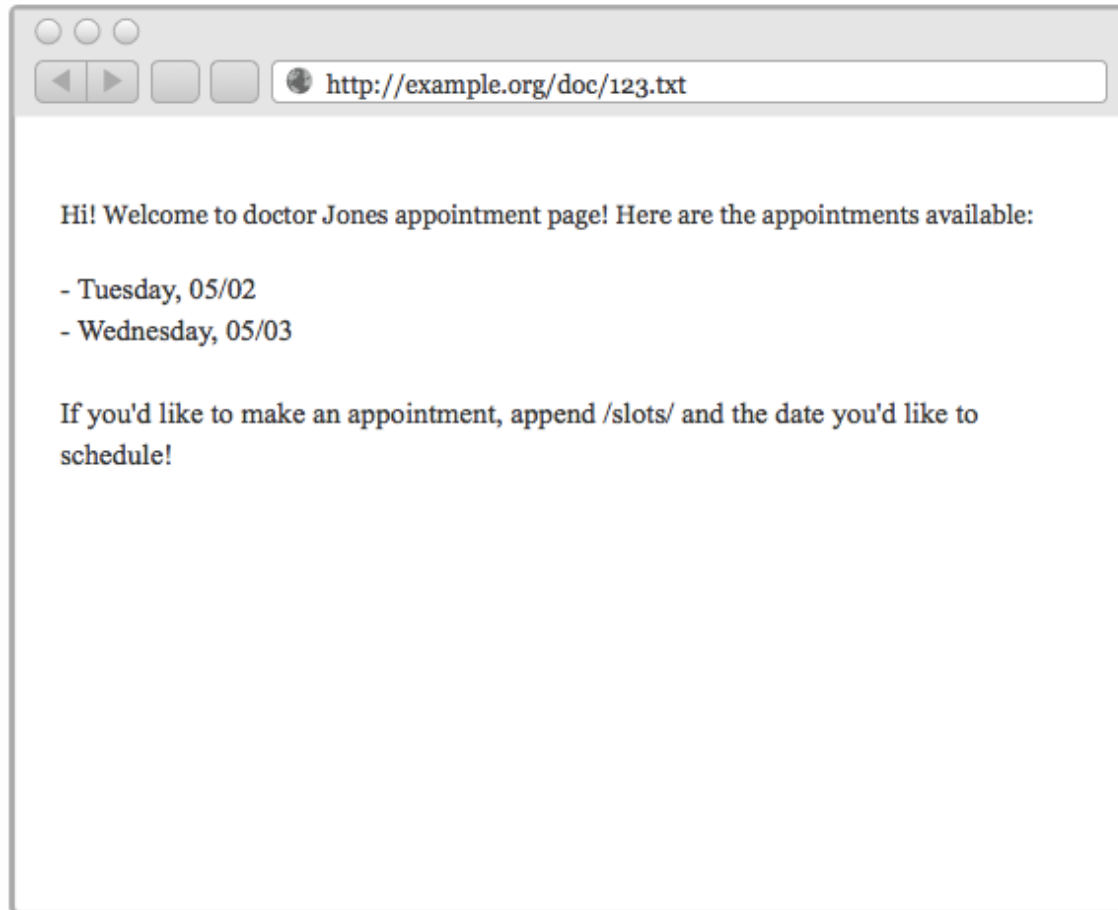
```
1. GET /doc/123/slots/05/02.txt?action=create HTTP/1.0  
2. Host: example.com
```

Looking at this as a Web Page

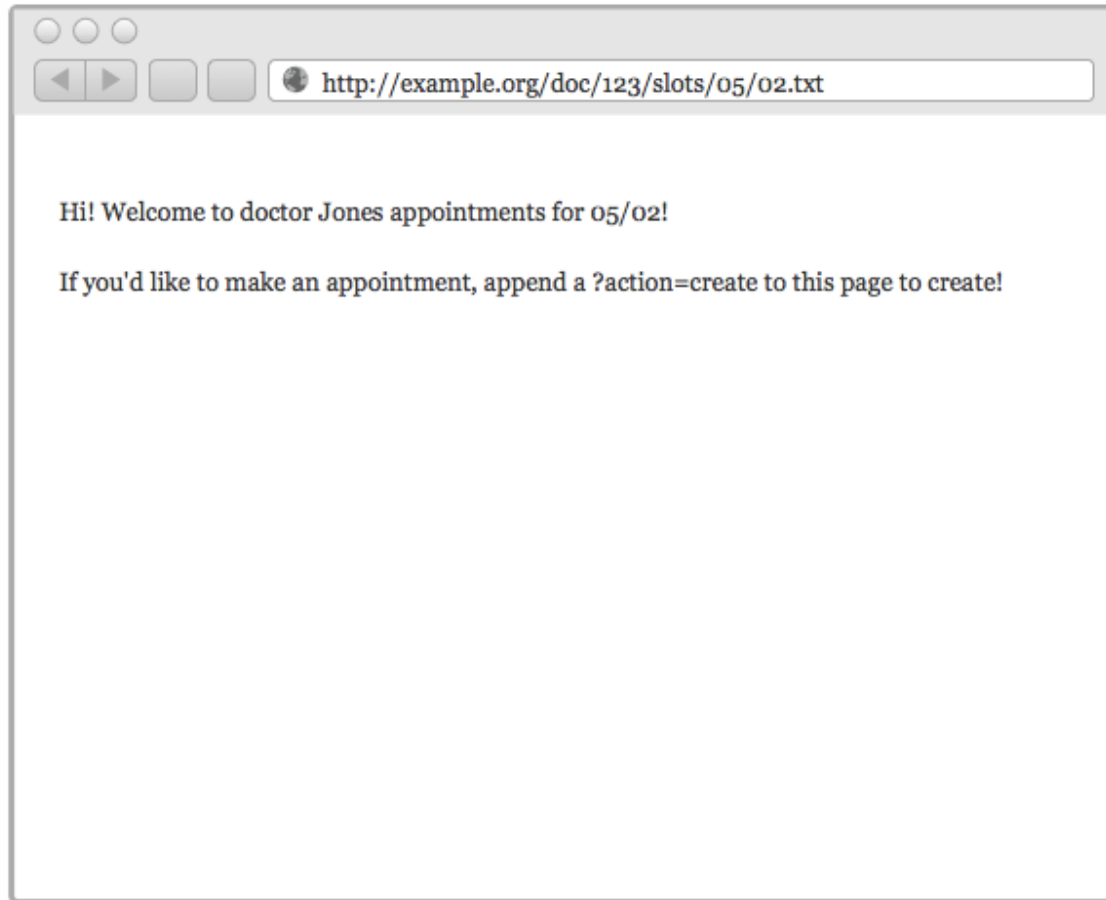


<http://blog.sgo.to/2014/04/what-your-api-would-look-like-as-webpage.html>

Looking at this as a Web Page

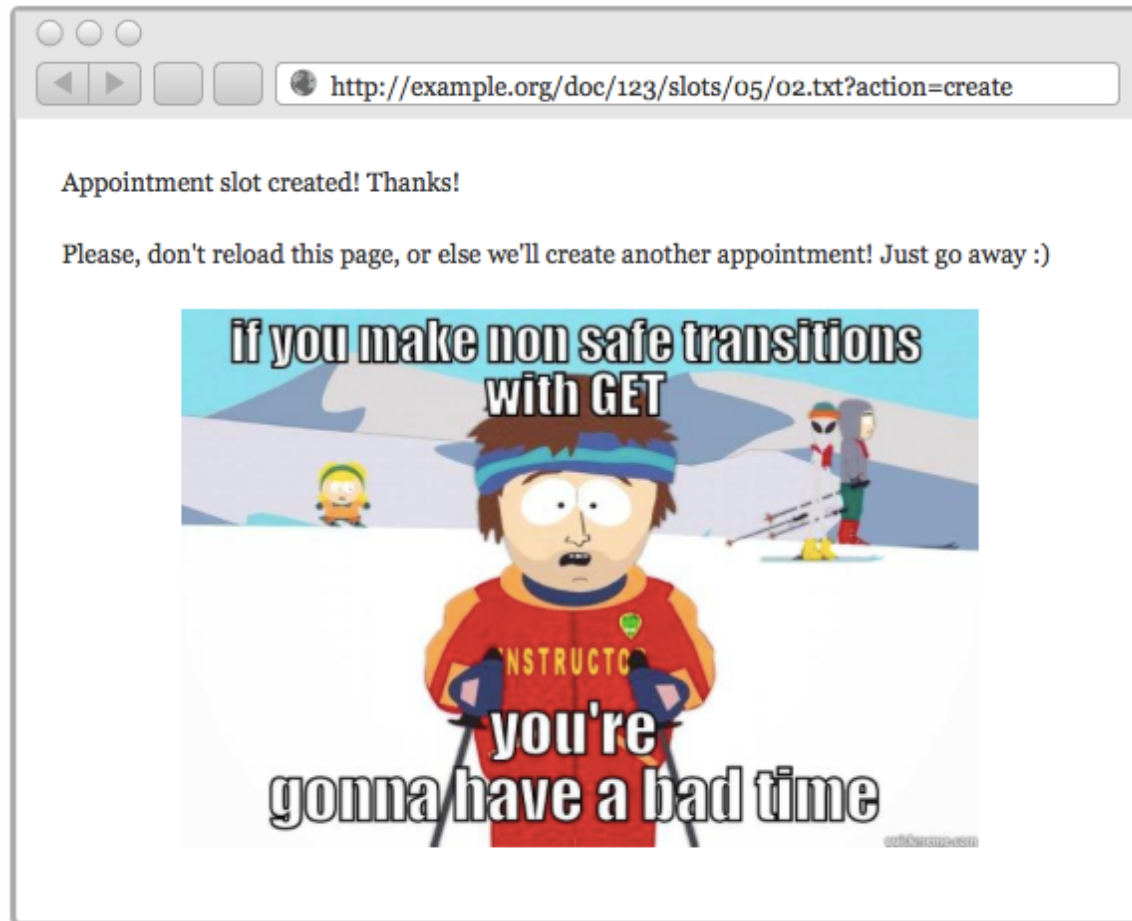


Looking at this as a Web Page



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Looking at this as a Web Page



<http://blog.sgo.to/2014/04/what-your-api-would-look-like-as-webpage.html>

Level 2 - HTTP Verbs

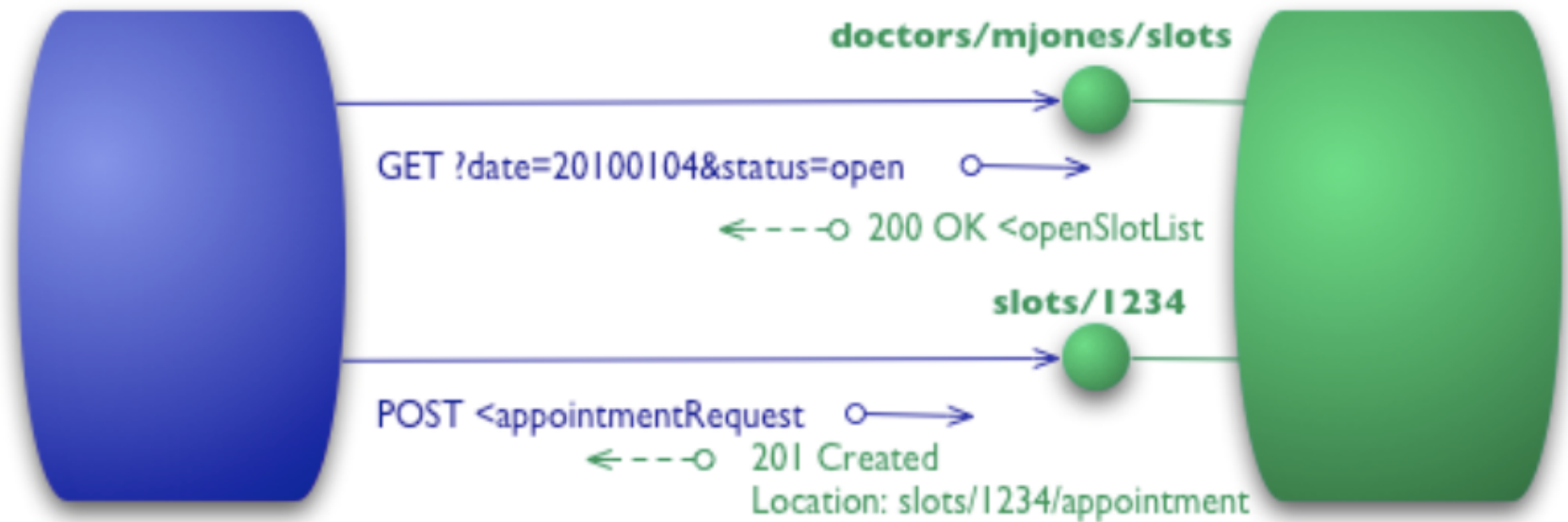
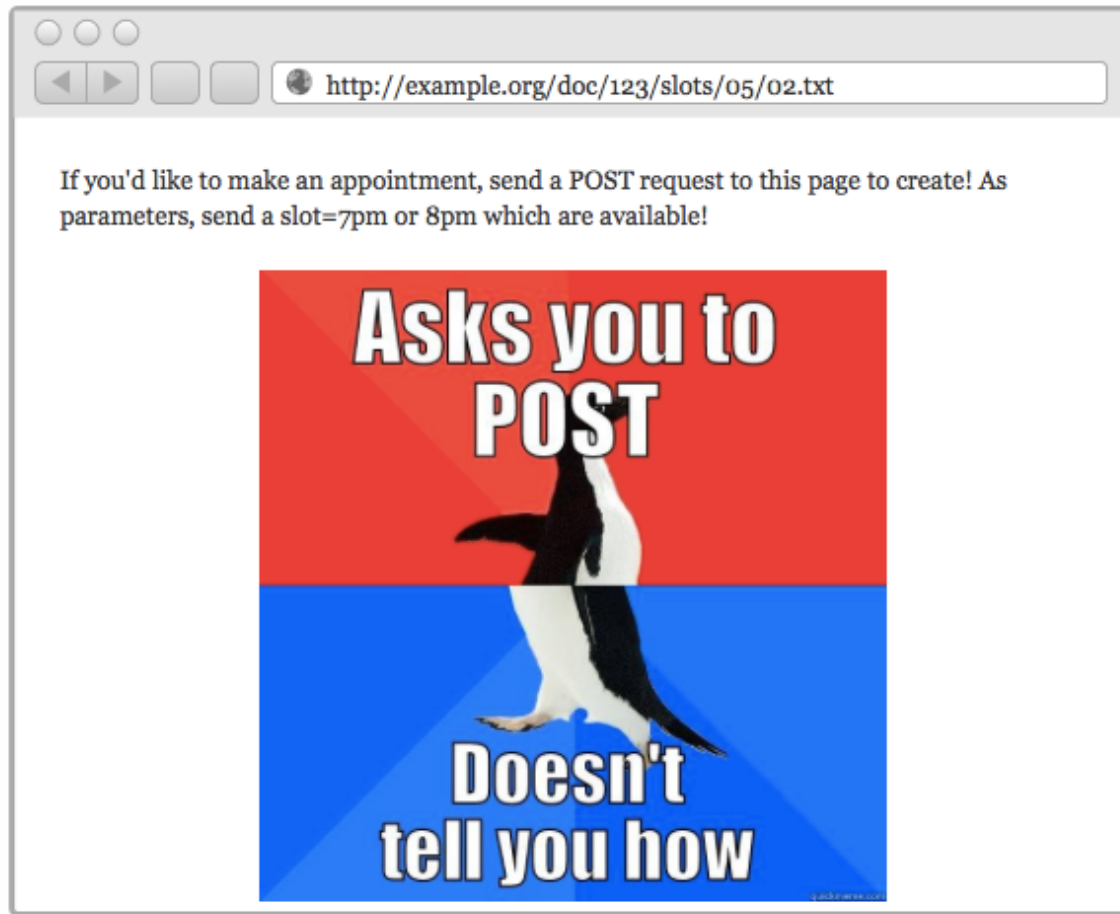


Figure 4: Level 2 adds HTTP verbs

An example Level 2 API

```
1. GET / HTTP/1.0
2. Host: example.com
3.
4. HTTP/1.0 200 OK
5. Content-Type: text/json
6. {
7.   "doctors": [{
8.     "name": "Dr. Jones",
9.     "id": "123"
10.  }]
11. }
```

Looking at this as a Web Page



Looking at this as a Web Page



Level 3 – Hypermedia Controls

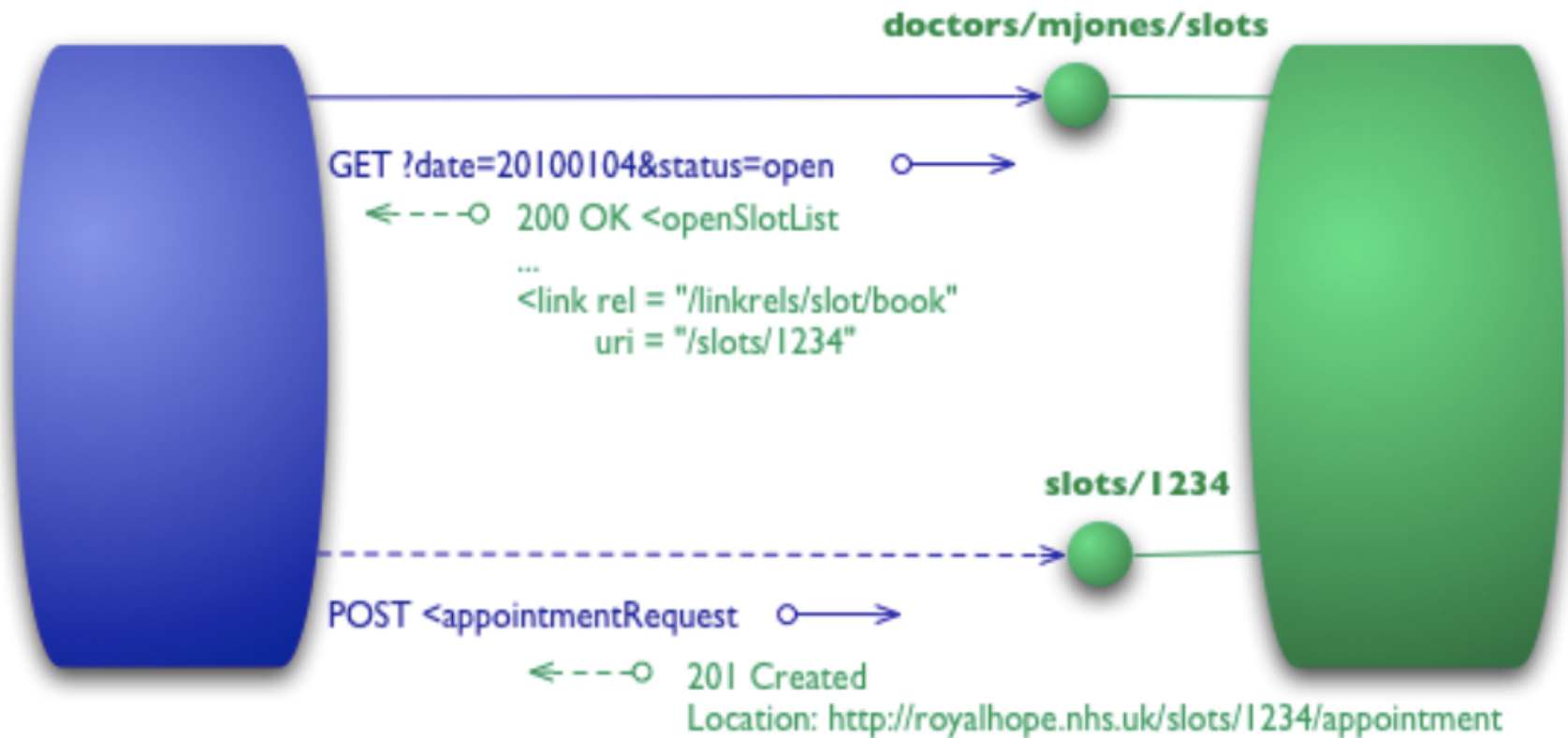
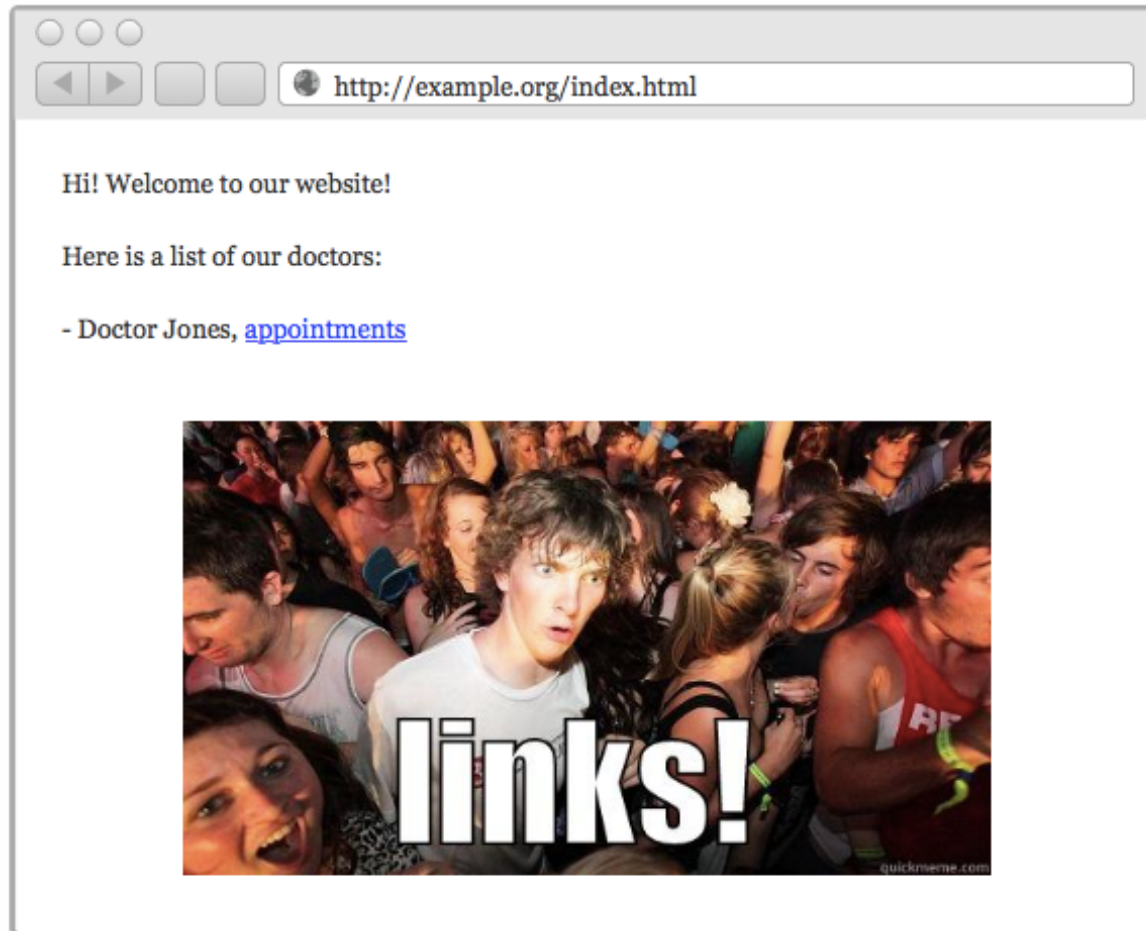


Figure 5: Level 3 adds hypermedia controls

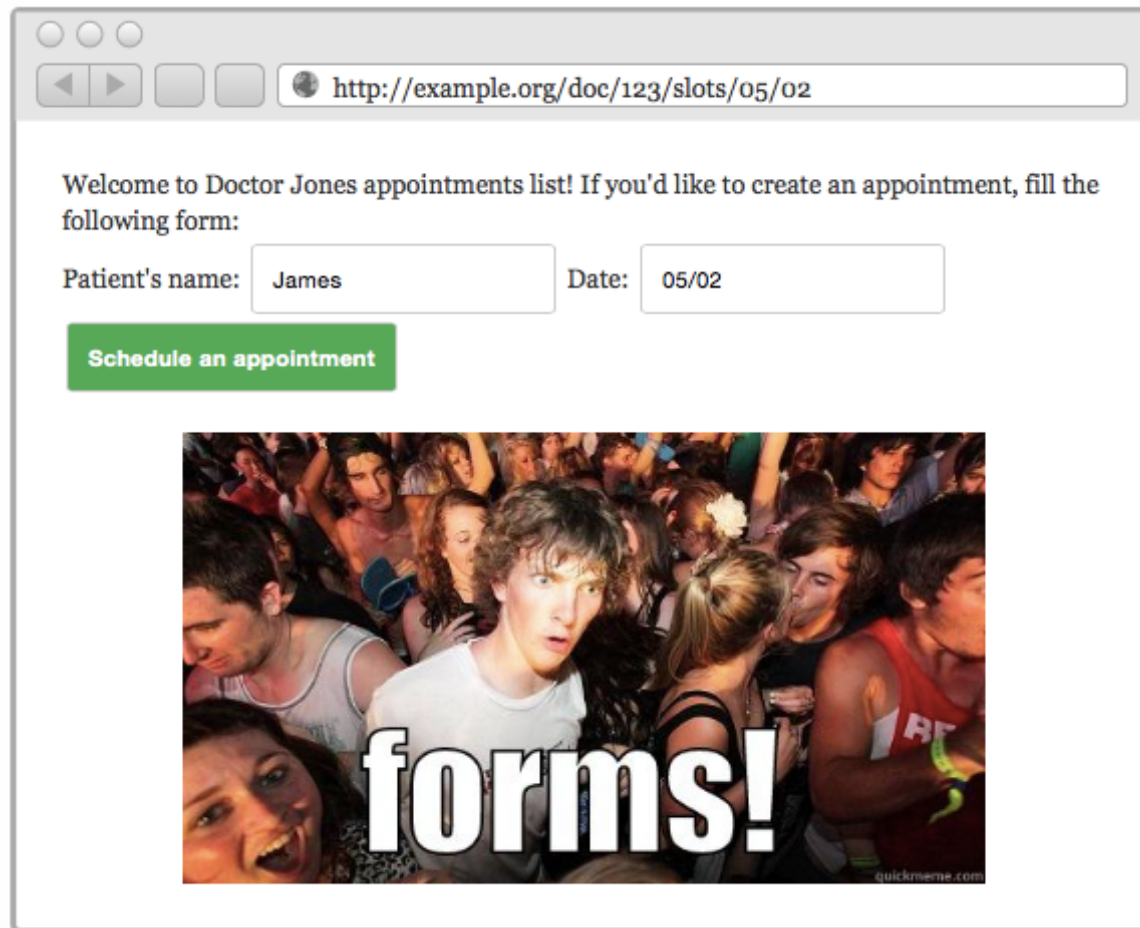
An example Level 3 API

```
1. GET / HTTP/1.0
2. Host: example.com
3.
4. HTTP/1.0 200 OK
5. Content-Type: text/ld+json
6. {
7.   "@context": "schema.org",
8.   "@type": "Clinic",
9.   "@id": "http://example.com/",
10.  "doctors": [{
11.    "@type": "Doctor",
12.    "@id": "http://example.com/doctors/123",
13.    "name": "Dr. Jones",
14.    "appointments": {
15.      "@type": "AppointmentBook",
16.      "@id": "http://example.com/doctors/123/slots",
17.      "action": {
18.        "@id": "http://example.com/doctors/123/slots",
19.        "@type": "ScheduleAction"
20.      }
21.    }
22.  }]
23. }
```

Looking at this as a Web Page



Looking at this as a Web Page



Using ALL of the Web

- **Level 1**
 - tackles the question of handling complexity by using divide and conquer, breaking a large service endpoint down into multiple resources.
- **Level 2**
 - introduces a standard set of verbs so that we handle similar situations in the same way, removing unnecessary variation.
- **Level 3**
 - introduces discoverability, providing a way of making a protocol more self-documenting.

Points to Note

- **XML is not the only way a resource can be represented**
- **The choice of representation is left to the implementation**
- **But remember the difference between Hypermedia formats and static formats**
 - **HTML vs. TXT**

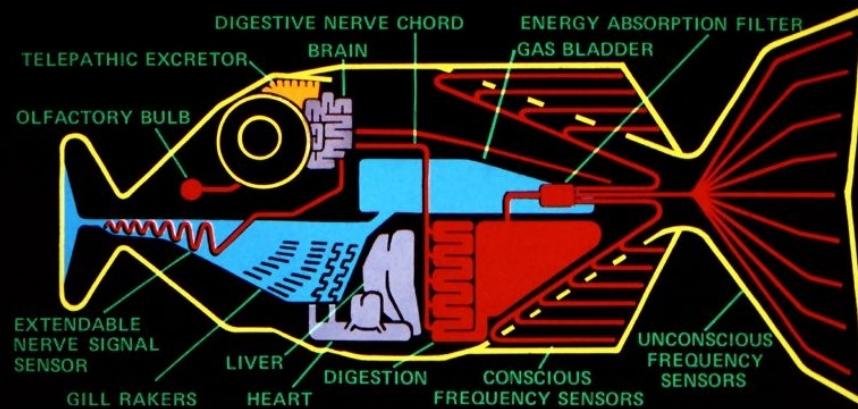
In Summary

- **Following principles of the Web**
 - Scalable
 - Recoverable
 - Fault-Tolerable
 - Secure
 - Loosely Coupled

These are the same requirements we have for software systems

The Glory of REST

The Babel Fish



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Thank You!

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