Webmachine

a practical executable model for HTTP

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a toolkit for HTTP-based systems

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a toolkit for easily creating
well-behaved HTTP-based systems

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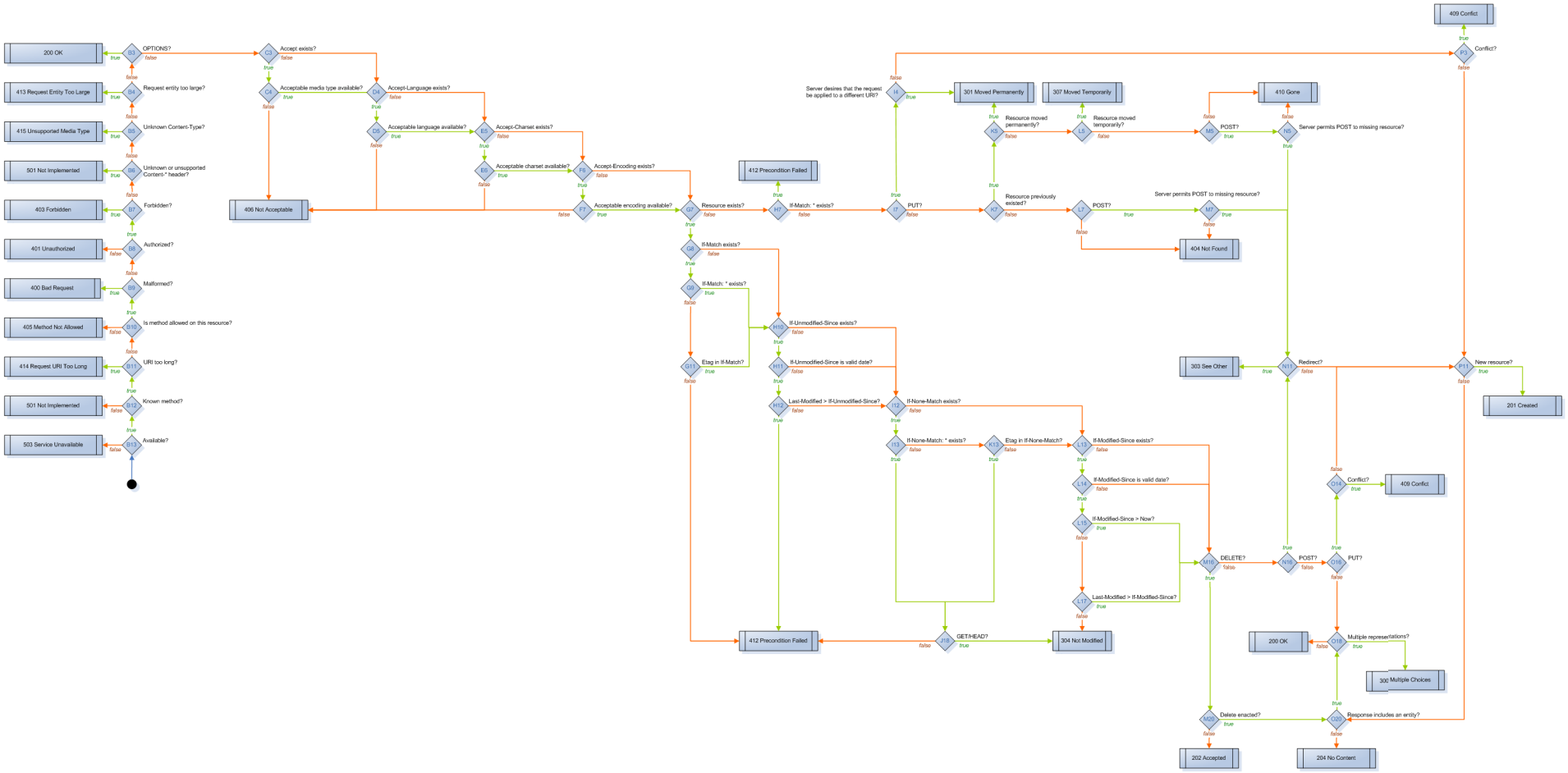
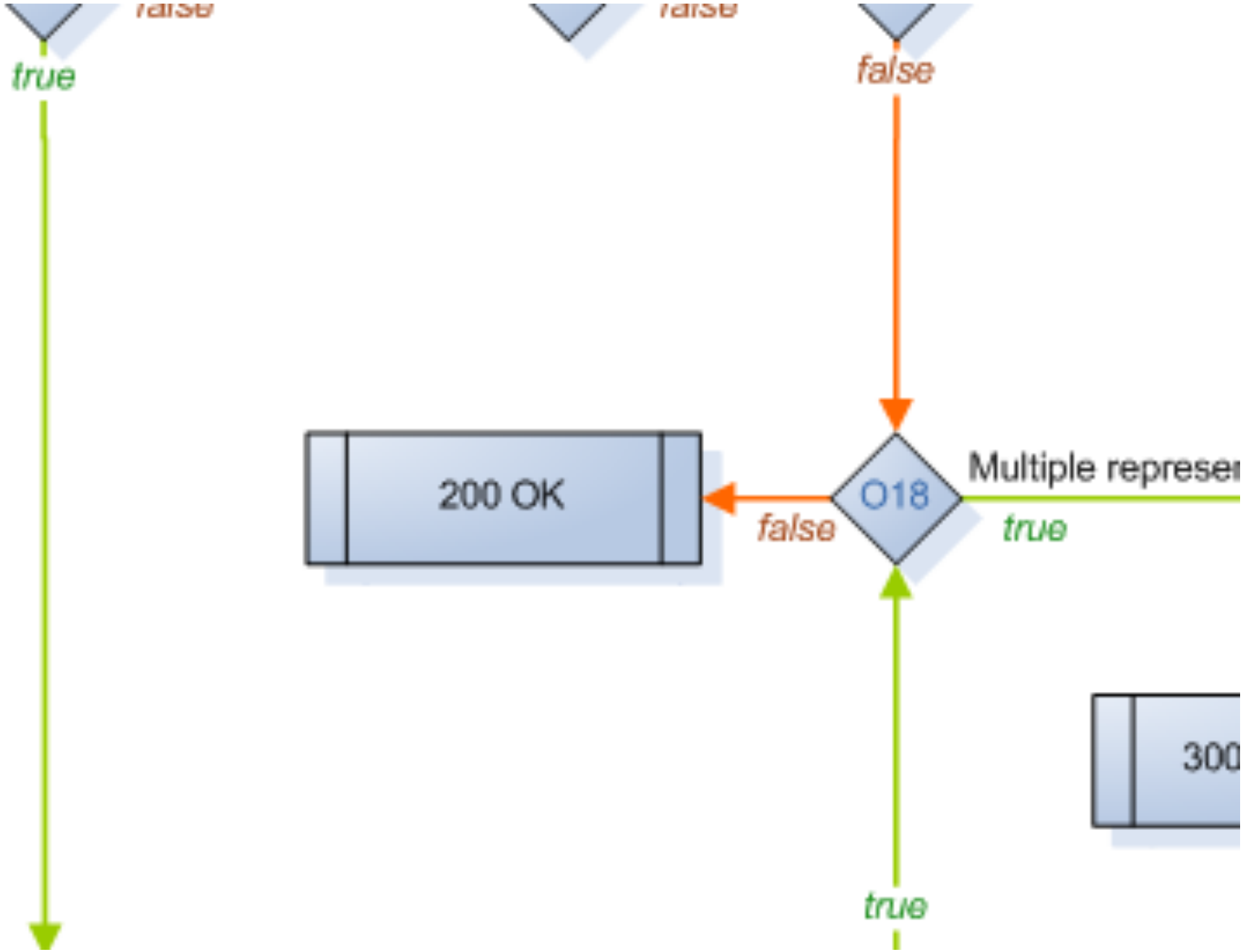


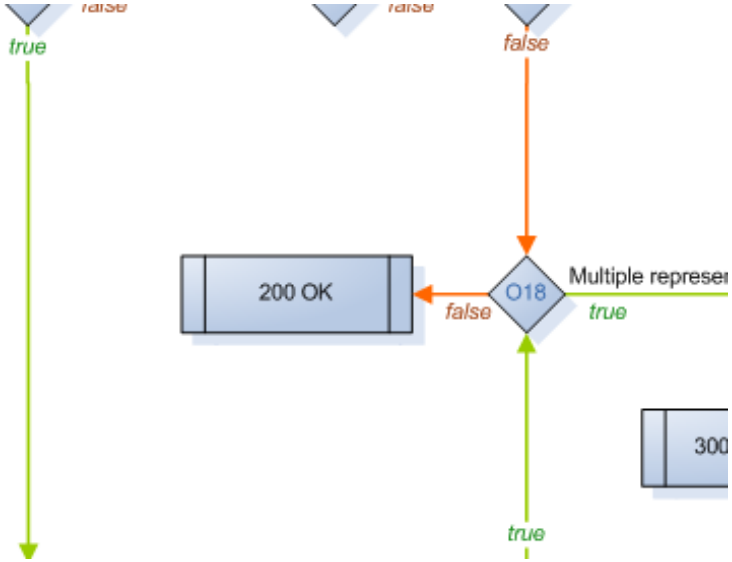
HTTP is complicated.



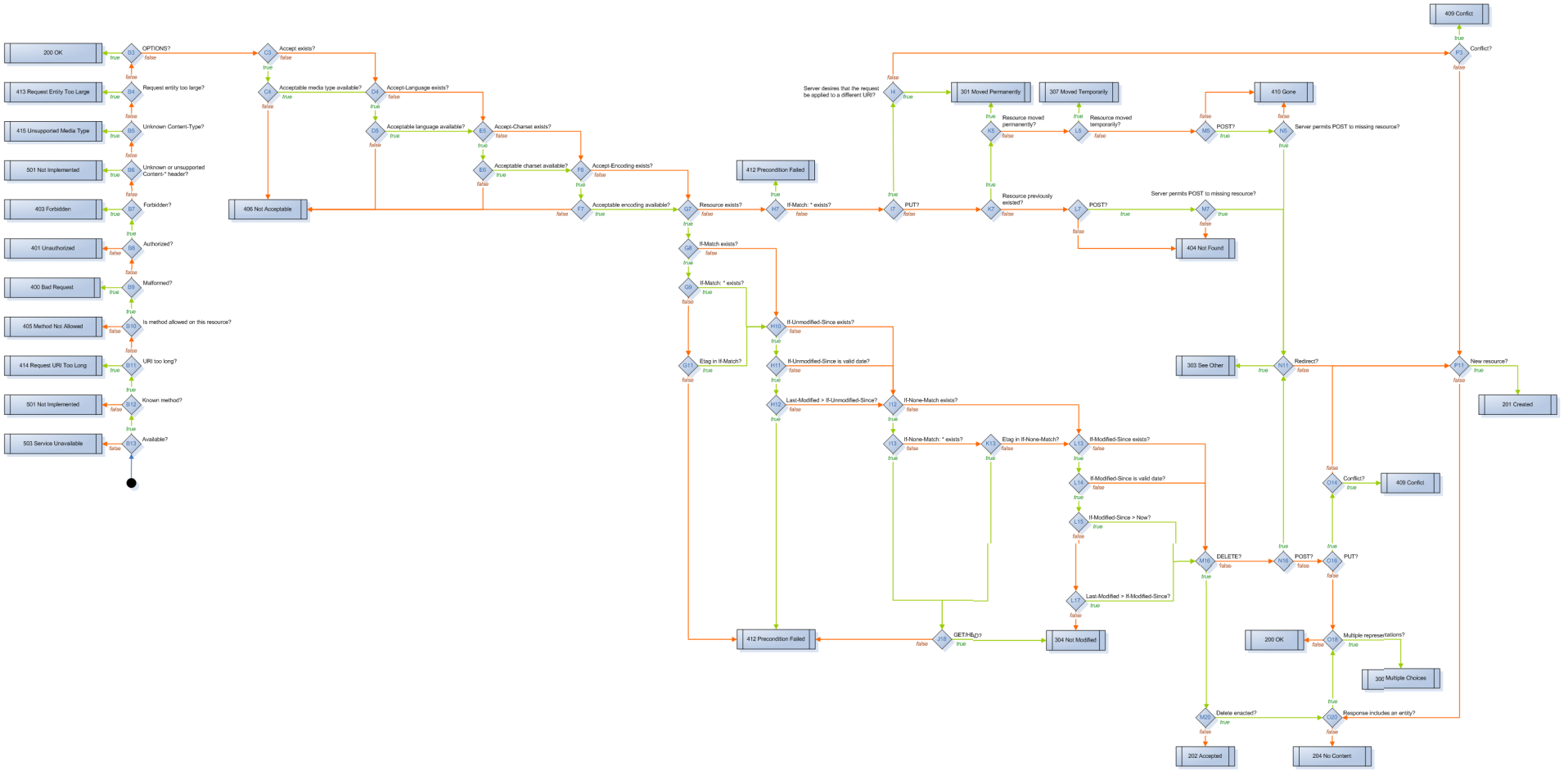
Webmachine makes HTTP easier.

```
-module(twohundred_resource).
-export([init/1, to_html/2]).
-include_lib("webmachine/include/webmachine.hrl").
init([]) -> {ok, undefined}.

to_html(ReqData, State) ->
    {"Hello, Webmachine world", ReqData, State}.
```

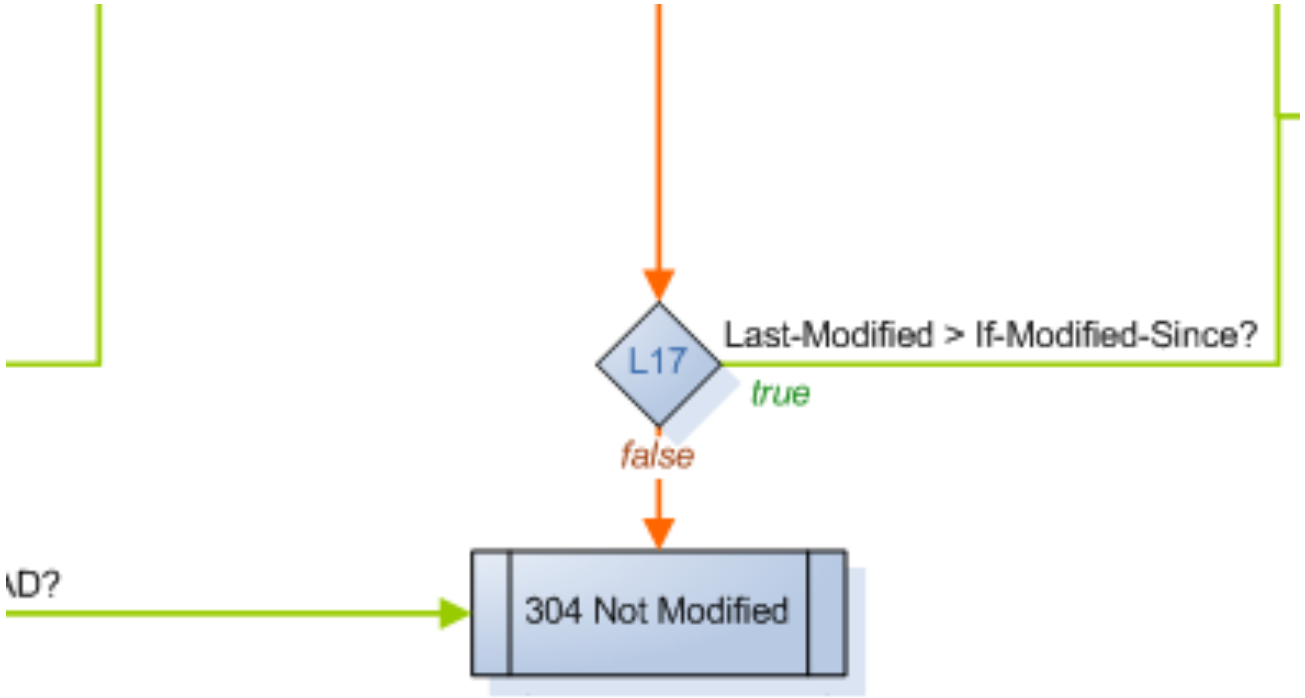


(that's it!)



Want to get more interesting?

Just add `generate_etag` or `last_modified`...



Just add `generate_etag` or `last_modified`...

...and now you have conditional requests.

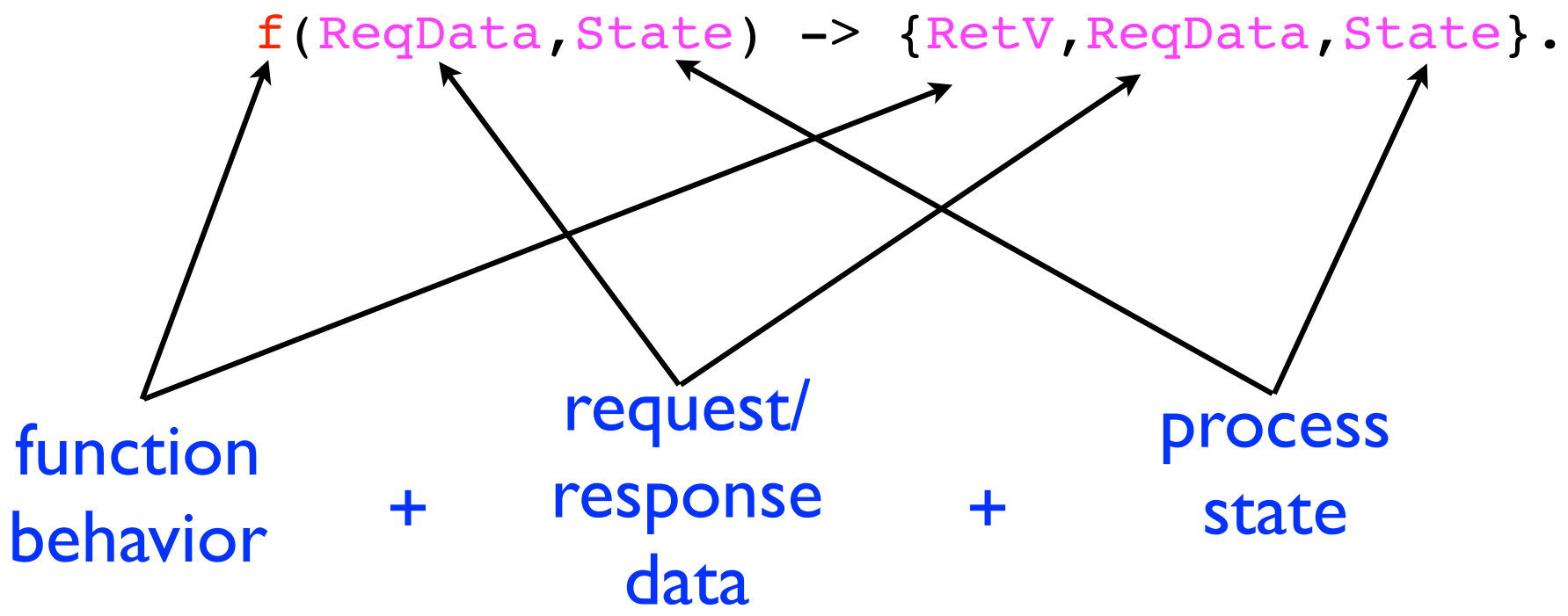
```
generate_etag(RD, State) ->
    {mochihex:to_hex(erlang:phash2(State)), RD, State}.

last_modified(RD, State) ->
    {filelib:last_modified(State#s.fpath), RD, State}.
```

A resource family is just a set of functions.

```
        to_html(ReqData,State) -> {Body,ReqData,State}.
  generate_etag(ReqData,State) -> {ETag,ReqData,State}.
  last_modified(ReqData,State) -> {Time,ReqData,State}.
resource_exists(ReqData,State) -> {bool,ReqData,State}.
  is_authorized(ReqData,State) -> {bool,ReqData,State}.
           ...f(ReqData,State) -> {RetV,ReqData,State}.
```

A resource family is just a set of functions.



Resource functions are referentially transparent and have a uniform interface.

Manipulating Request/Response Data

```
f(ReqData,State) -> {RetV,ReqData,State}.
```

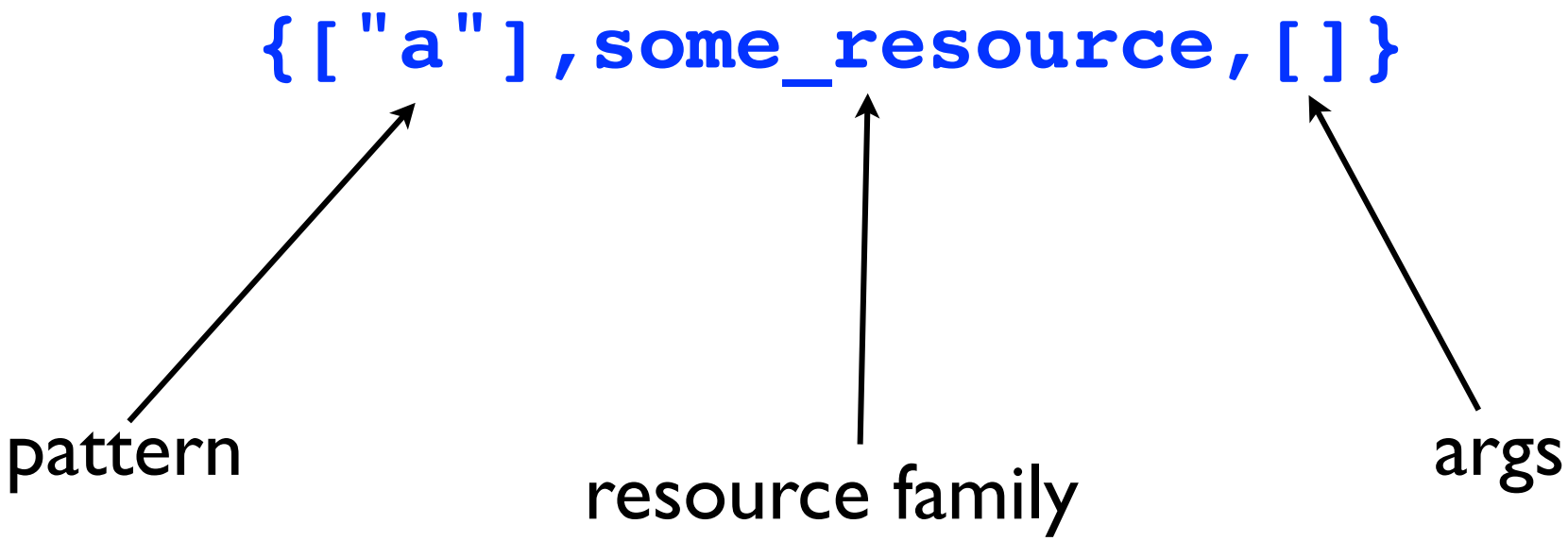
```
wrq:get_req_header(HdrName,ReqData) -> 'undefined' | HdrVal

wrq:get_qs_value(Key,Default,ReqData) -> Value

wrq:set_resp_header(HdrName,HdrVal,ReqData) -> NewReqData
```

The `wrq` module accesses and (nondestructively) modifies ReqData.

URL Dispatching = Pattern Matching



URL Dispatching = Pattern Matching

```
{["a"],some_resource,[]}
```

`http://myhost/a` ⟶ match!

`any other URL` ⟶ no match

If no patterns match, then `404 Not Found`.

URL Dispatching = Pattern Matching

```
{["a"],some_resource,[]}
```

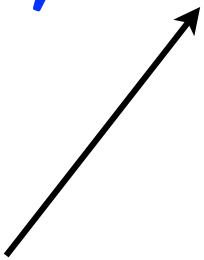
/a

[ ]	wrq:disp_path
"/a"	wrq:path
[ ]	wrq:path_info
[ ]	wrq:path_tokens

URL Dispatching = Pattern Matching

```
{["a", '*'],some_resource,[]}
```

/a



(binds the remaining path)

[]	wrq:disp_path
"/a"	wrq:path
[]	wrq:path_info
[]	wrq:path_tokens

URL Dispatching = Pattern Matching

```
{["a", '*'],some_resource,[]}
```

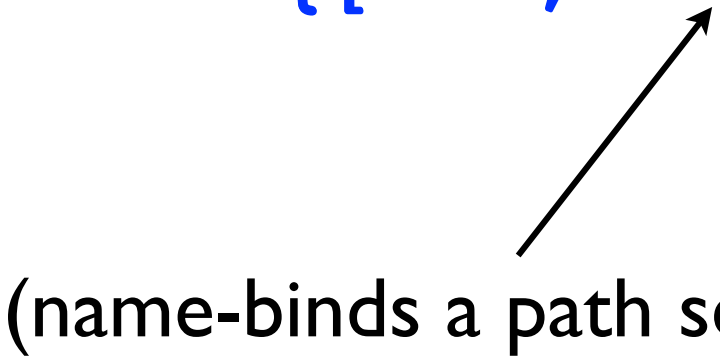
/a/b/c

"b/c"	wrq:disp_path
"/a/b/c"	wrq:path
[]	wrq:path_info
["b", "c"]	wrq:path_tokens

URL Dispatching = Pattern Matching

```
{["a", foo],some_resource,[]}
```

/a/b/c ⟶ 404



(name-binds a path segment)

"b/c"
"/a/b/c"
[]
["b", "c"]

wrq:disp_path
wrq:path
wrq:path_info
wrq:path_tokens

URL Dispatching = Pattern Matching

```
{["a", foo],some_resource,[]}
```

/a/b

`[]`	wrq:disp_path
`"/a/b"`	wrq:path
`[{foo, "b"}]`	wrq:path_info
`[]`	wrq:path_tokens

URL Dispatching = Pattern Matching

```
{["a", foo, '*'],some_resource,[]}
```

/a/b

`[]`	wrq:disp_path
`"/a/b"`	wrq:path
`[{foo, "b"}]`	wrq:path_info
`[]`	wrq:path_tokens

URL Dispatching = Pattern Matching

```
{["a", foo, '*'],some_resource,[]}
```

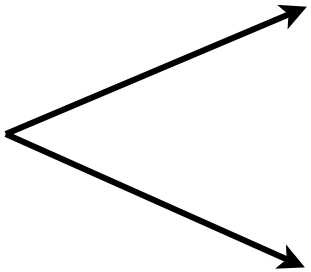
/a/b/c/d

"c/d"	wrq:disp_path
"/a/b/c/d"	wrq:path
[{foo, "b"}]	wrq:path_info
["c","d"]	wrq:path_tokens

URL Dispatching = Pattern Matching

```
{["a", foo, '*'],some_resource,[]}
```

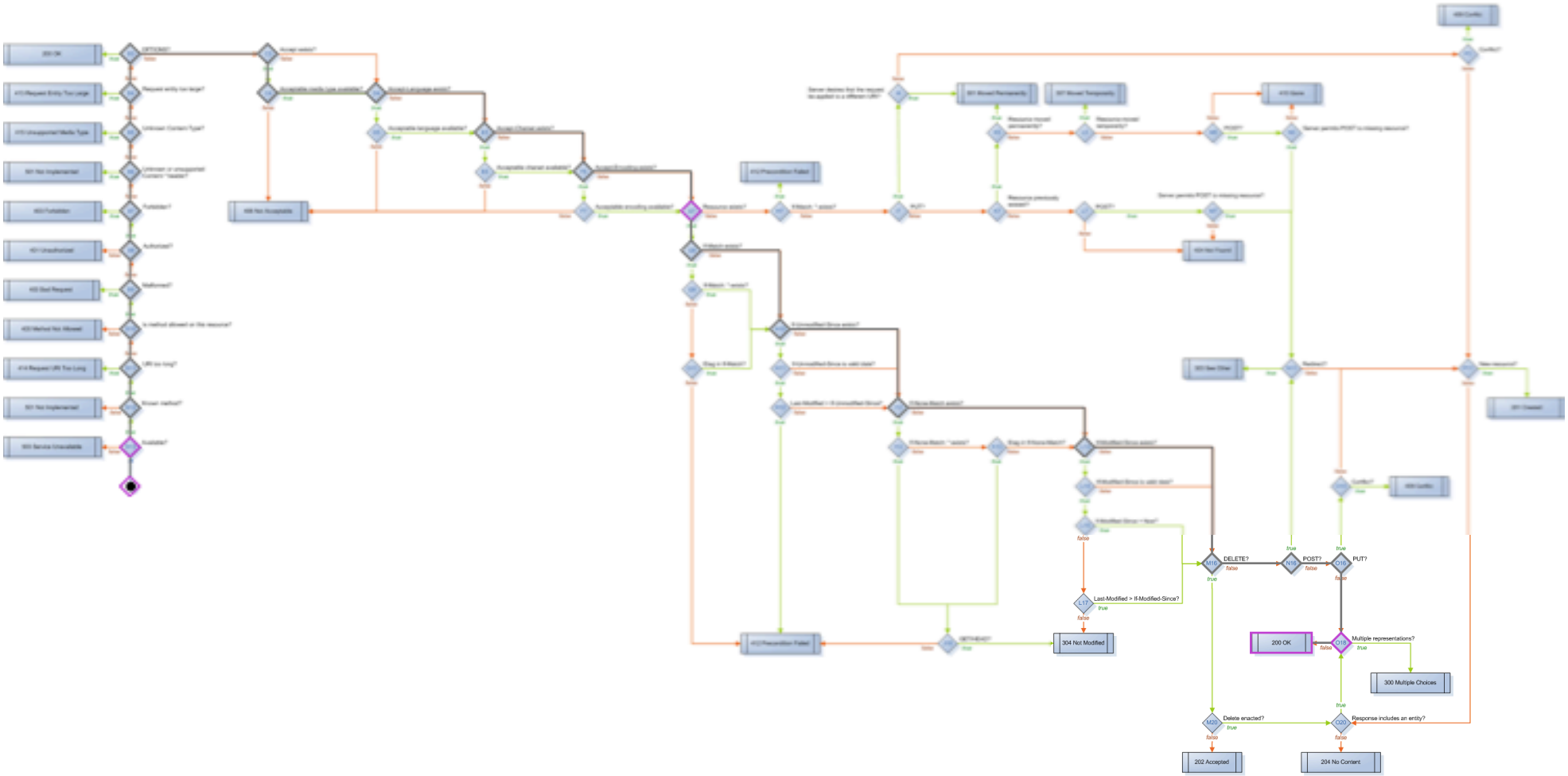
/a/b/c/d?fee=ah&fie=ha



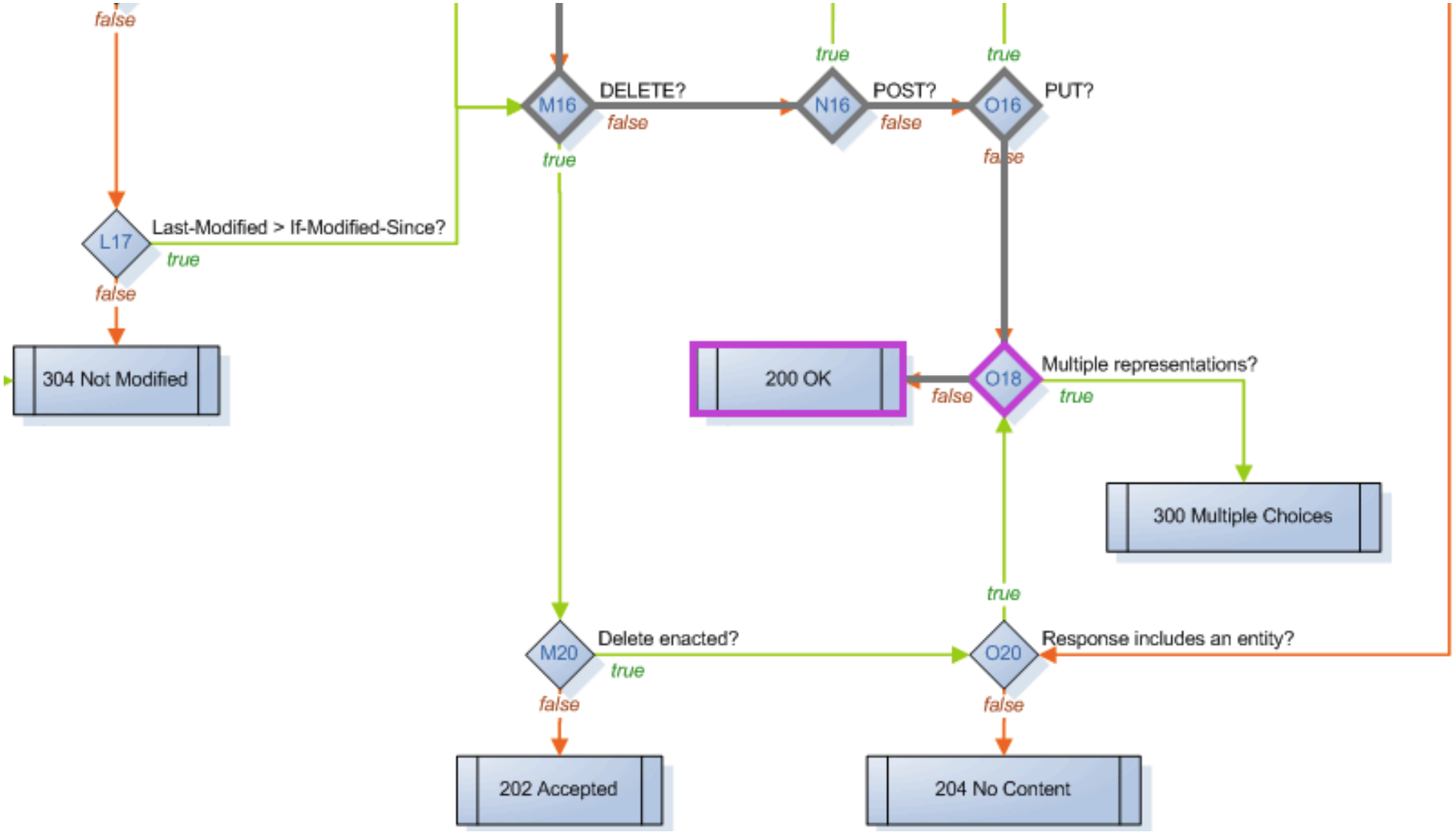
query strings are easy too

wrq:get_qs_value("fie",ReqData) -> “ha”

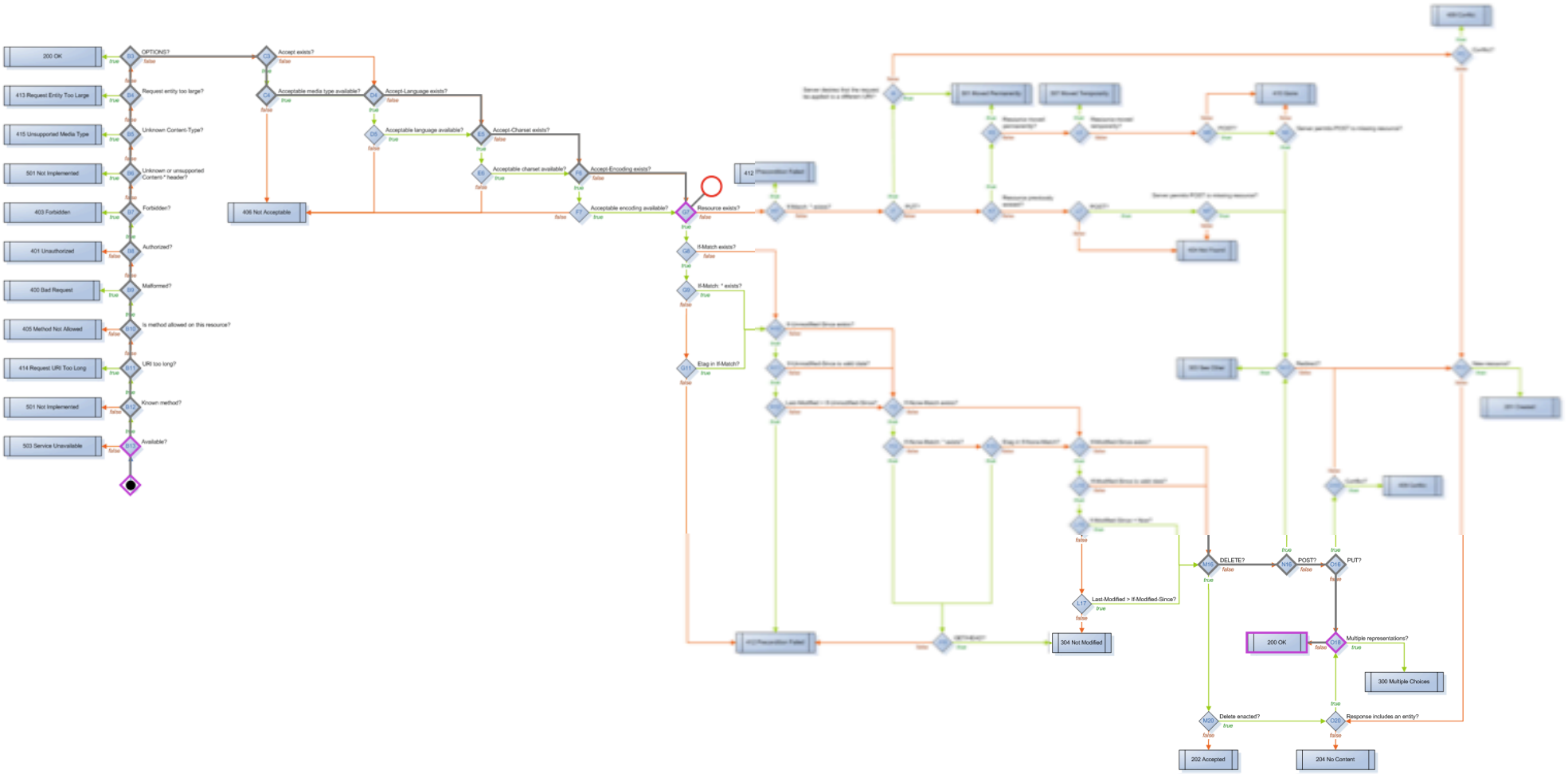
“c/d”	wrq:disp_path
"/a/b/c/d"	wrq:path
[{foo, “b”}]	wrq:path_info
[“c”,”d”]	wrq:path_tokens



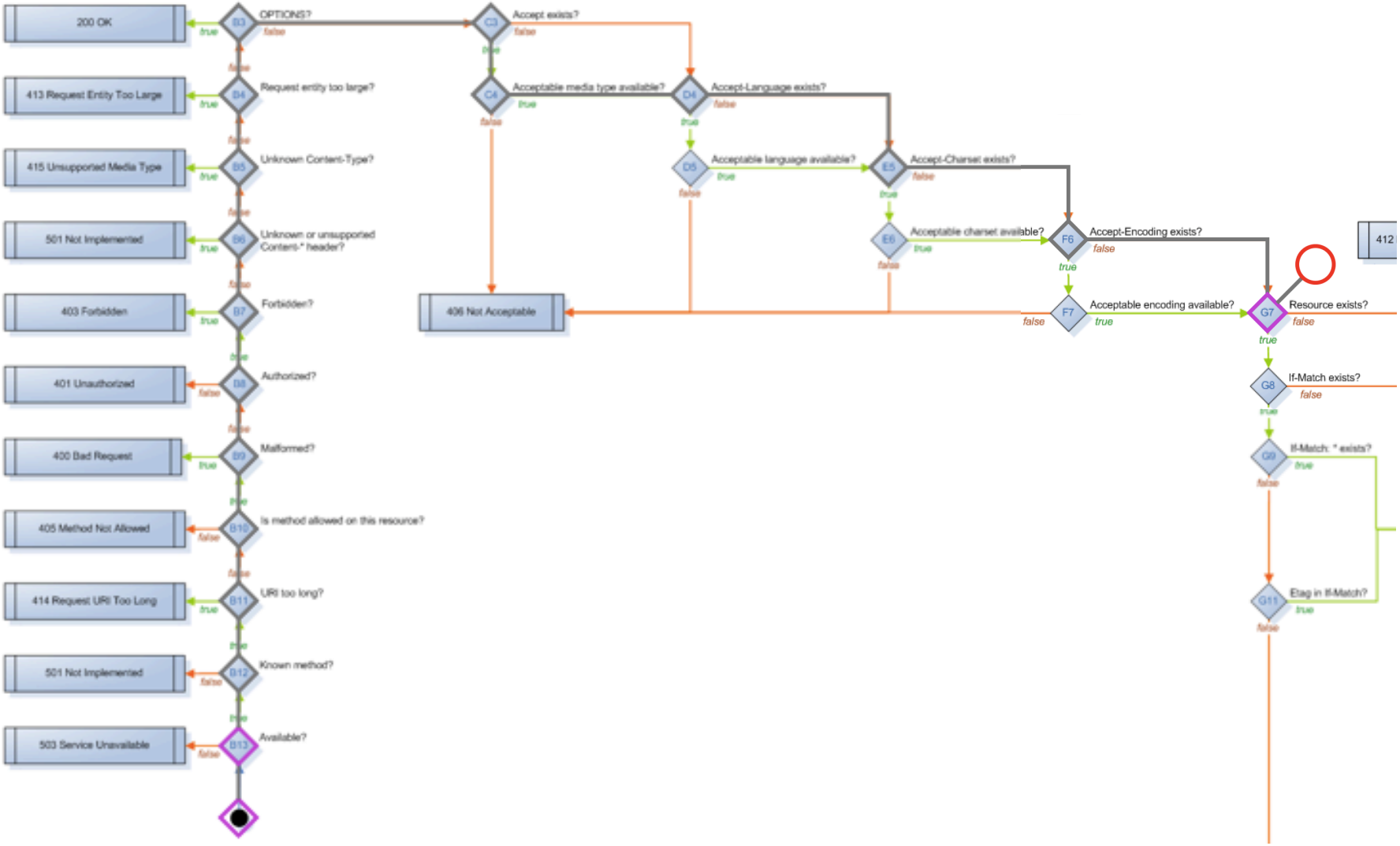
The Webmachine Visual Debugger


false
L17
Last-Modified > If-Modified-Since?
true
false
304 Not Modified
M16
DELETE?
false
true
N16
POST?
false
true
O16
PUT?
false
true
200 OK
O18
Multiple representations?
false
true
300 Multiple Choices
M20
Delete enacted?
true
false
202 Accepted
true
O20
Response includes an entity?
false
204 No Content

Hooray!

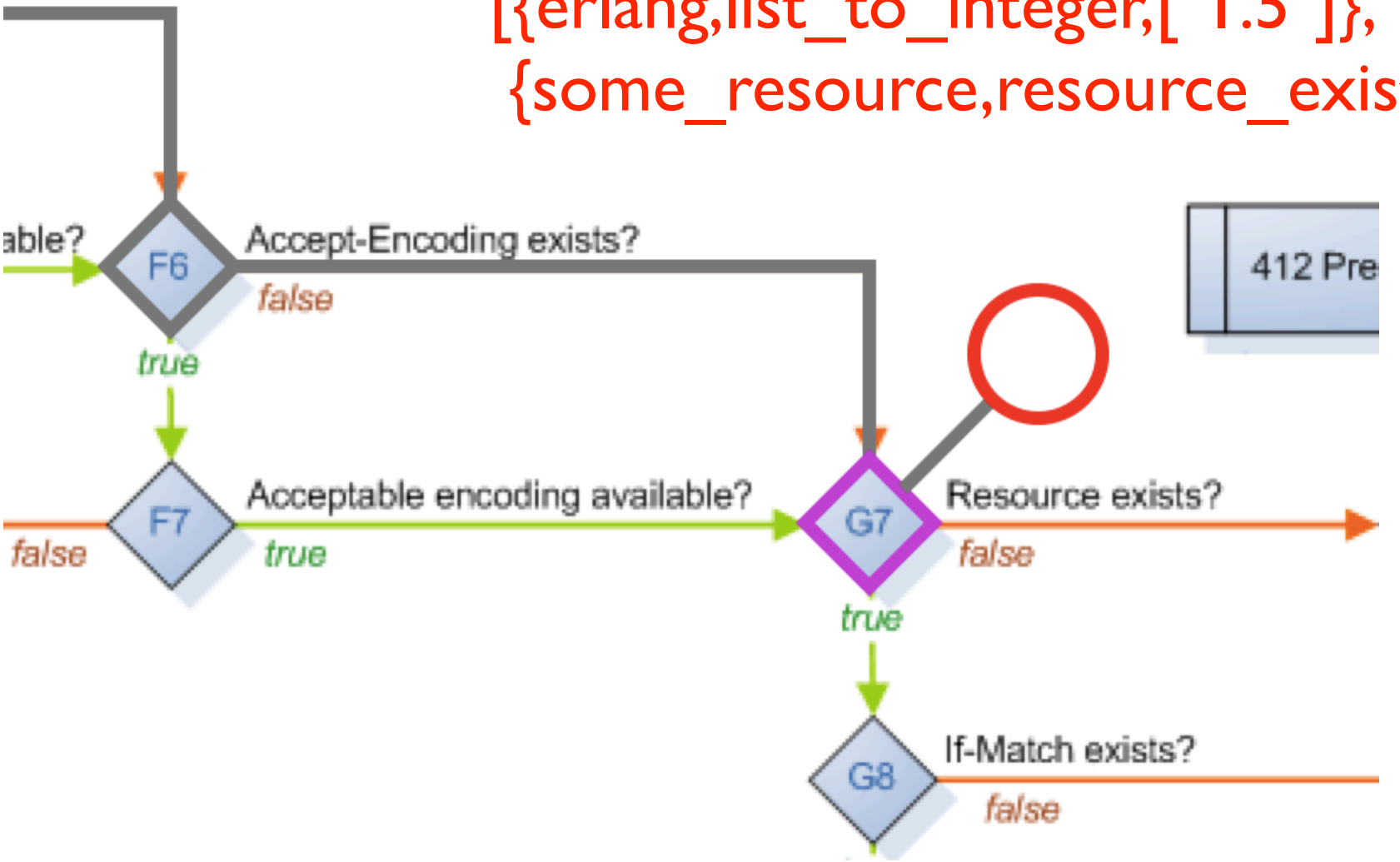


But sometimes things don't go as well.



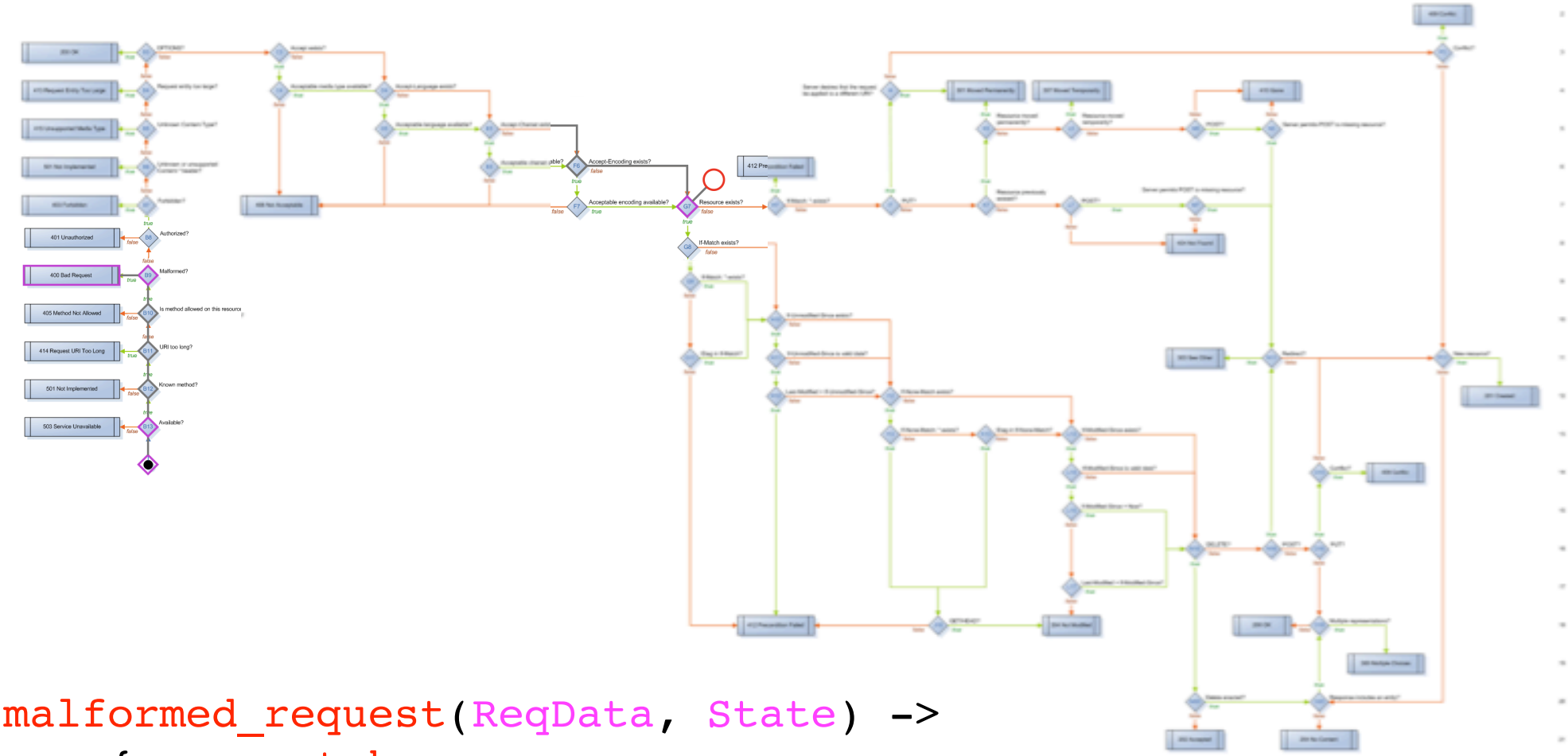
It's nice to know where your errors are.

{{error,{error,badarg,
[{erlang,list_to_integer,["1.5"]},
{some_resource,resource_exists,2}...

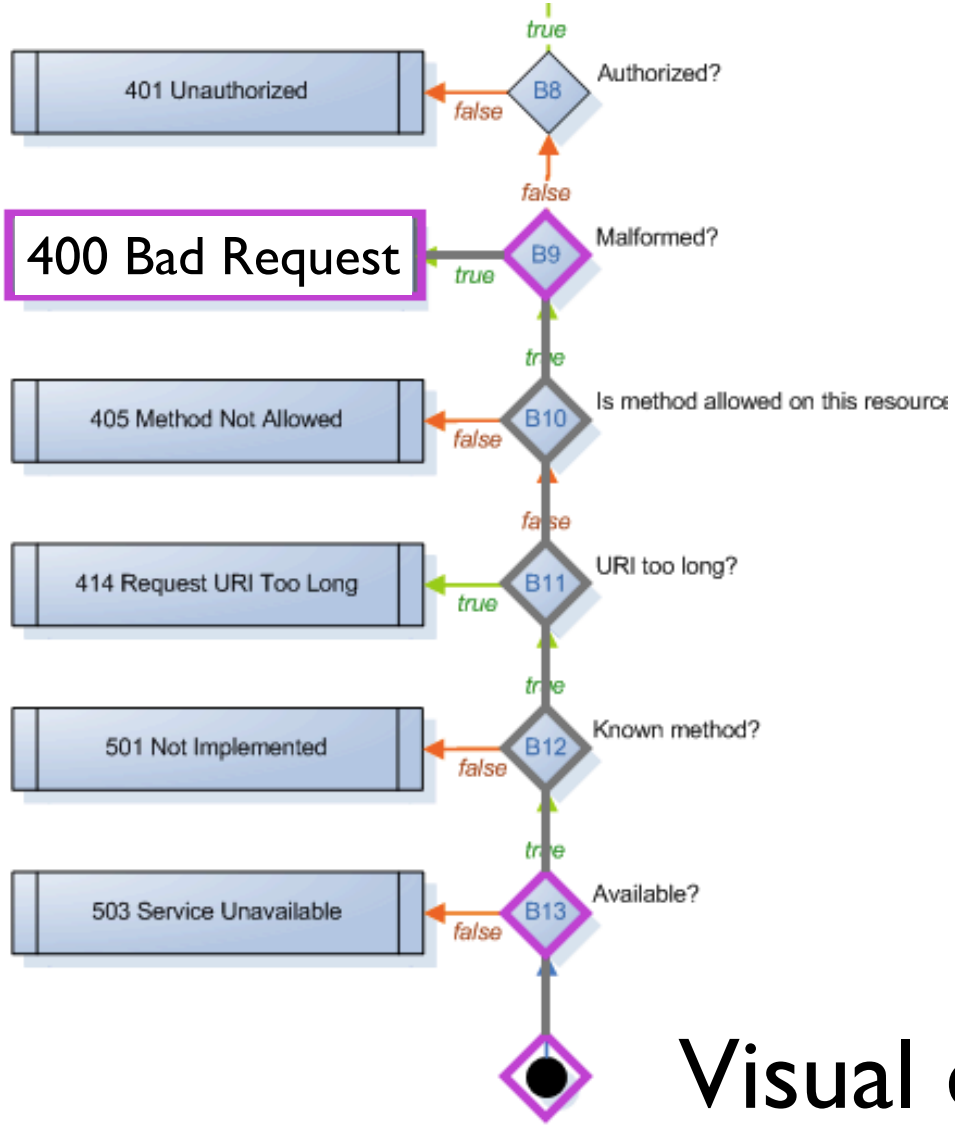



```
wrq:path(RD) -> "/d/test?q=1.5"
```

```
-export([malformed_request/2]).
```

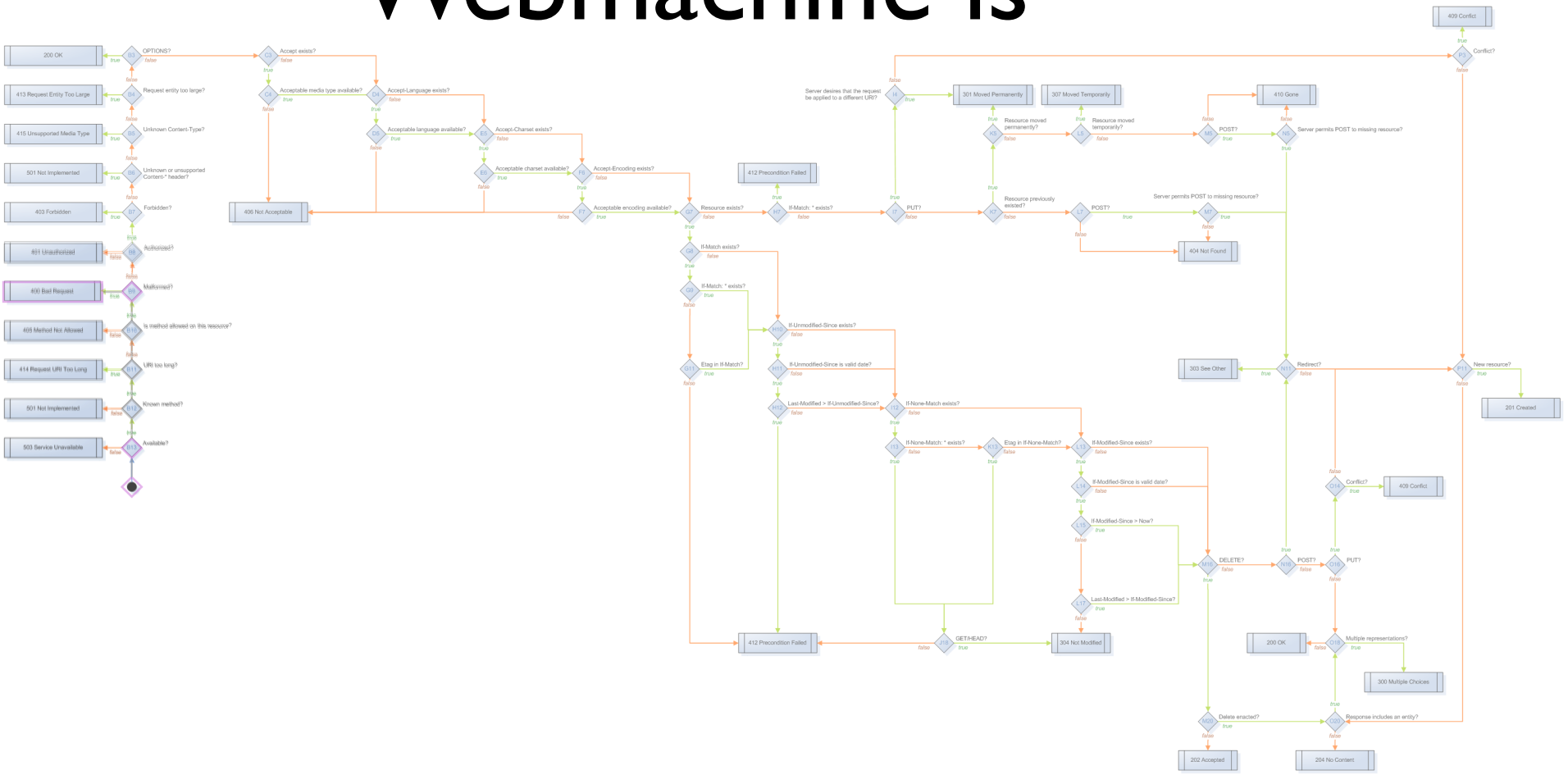



```
malformed_request(ReqData, State) ->
    {case catch
      list_to_integer(wrq:get_qs_value("q","0",ReqData)) of
        {'EXIT', _} -> true;
        _ -> false
    end,
    ReqData, State}.
```



Visual debugging helps you put the fixes in the right place.

Webmachine is



a higher-level abstraction for HTTP.

Webmachine is not a “framework.”

No built-in templating, no ORM or built-in storage.

Webmachine is a good component in a framework.

Webmachine is not an all-purpose network server.

No support for arbitrary sockets, etc.

Webmachine is shaped like HTTP.

Webmachine is
a resource server for the Web.

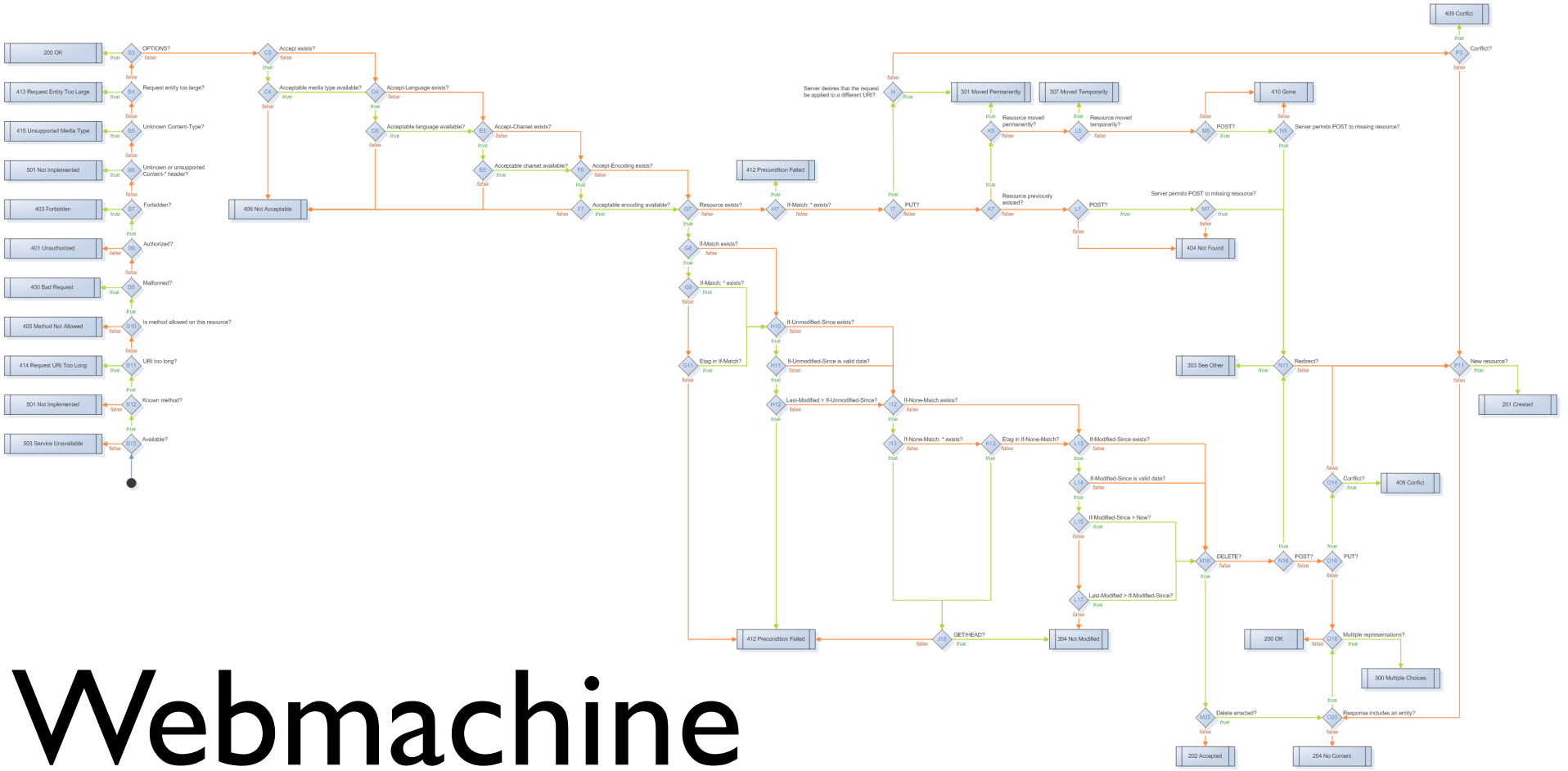
A toolkit for easily creating
well-behaved HTTP systems.

Webmachine is
sincerely flattered.

dj-webmachine: Django/Python

clothesline: Clojure

lemmachine: Agda



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