

# Introduction to LAMP, Web Architecture, and HTTP

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<http://www.cs.odu.edu/~jbrunelle/cs518>

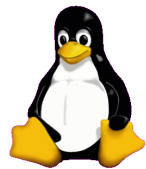
# LAMP

- Linux
- Apache
- MySQL
- PHP

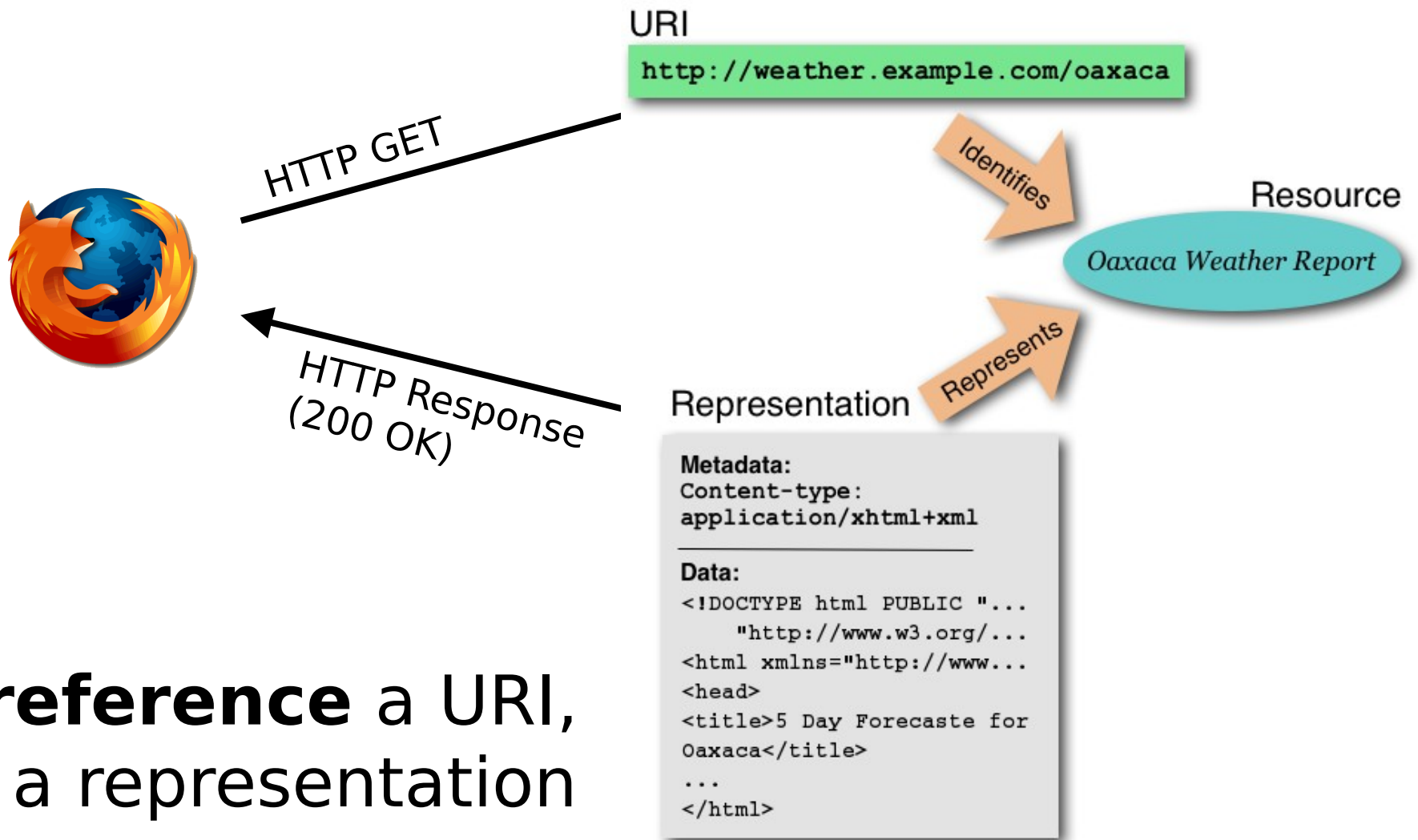


# Why Love LAMP?

- Free and Open Source Software (FOSS)
- Server-side focus
  - JavaScript == bad
- Basic web paradigms
  - Can extend to MEAN stack (Mongo, ExpressJS, Angular, NodeJS)



# Web Architecture



**Dereference** a URI,  
get a representation

# HTTP Request

```
$ curl -i -v http://www.cs.odu.edu/
> GET / HTTP/1.1
> User-Agent: curl/7.19.7 (x86_64-redhat-linux-gnu) libcurl/7.19.7
  NSS/3.13.1.0 zlib/1.2.3 libidn/1.18 libssh2/1.2.2
> Host: www.cs.odu.edu
> Accept: */*
>
< HTTP/1.1 200 OK
< Server: nginx
< Date: Tue, 25 Mar 2014 23:42:38 GMT
< Content-Type: text/html
< Transfer-Encoding: chunked
< Connection: keep-alive
<
```

# HTTP Response

HTTP/1.1 200 OK

Server: nginx

Date: Tue, 25 Mar 2014 23:40:09 GMT

Content-Type: text/html

Transfer-Encoding: chunked

Connection: keep-alive

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
<!-- saved from url=(0036)http://www.cs.odu.edu/newcssite/new/ -->
<!-- saved from url=(0019)http://sci.odu.edu/ -->
<HTML xmlns:st1 = "urn:schemas-microsoft-com:office:smarttags">
<HEAD>
<meta name="verify-v1"
  content="CXMn8RoyhZpl9fsKpbgxtiFw3kIdHD51r/ntbf1Rrcw=" >
<TITLE>Department Of Computer Science</TITLE>
```

# User Agent

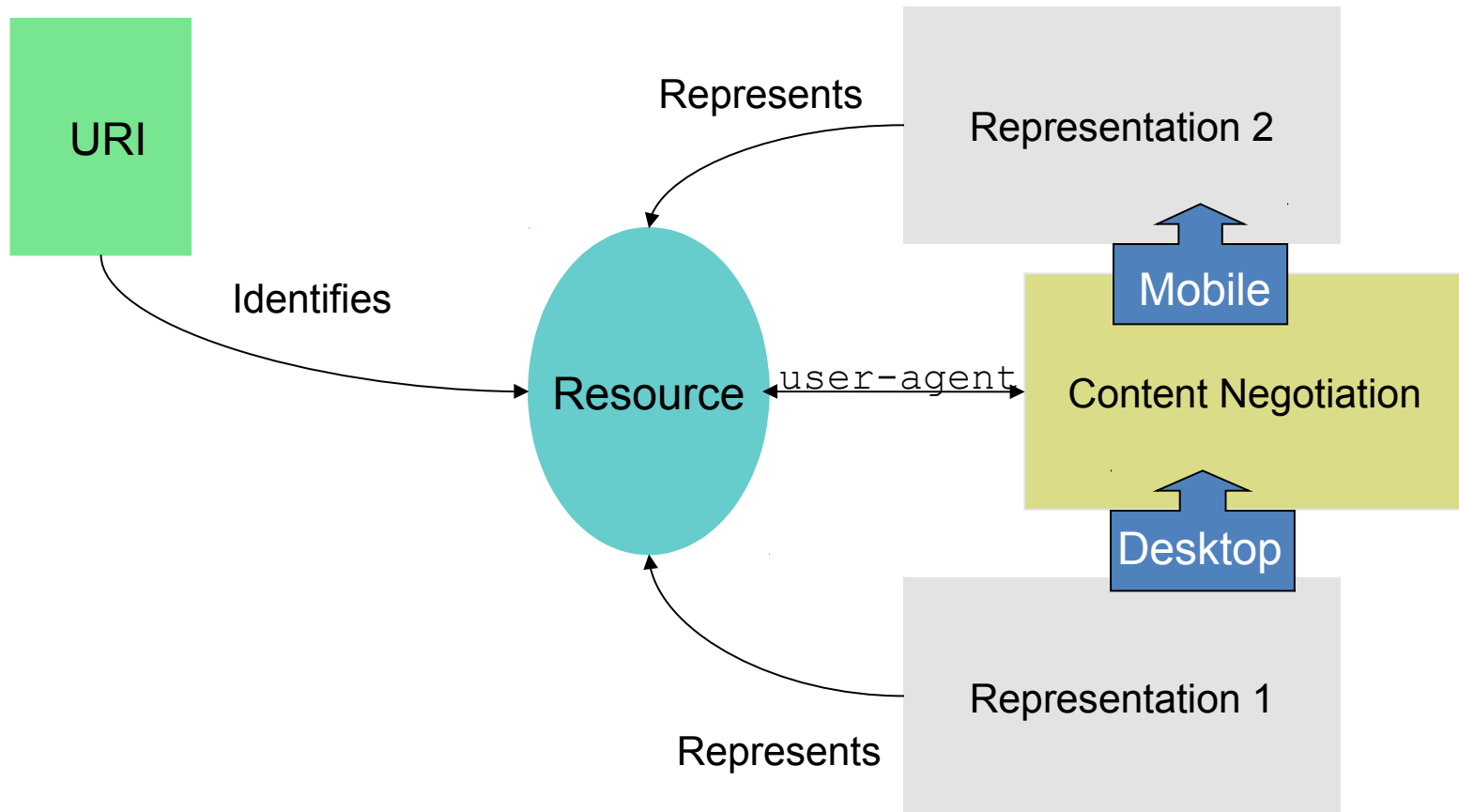
- Web browser
- Command line
- Anything used to navigate the web

# Web server

- Handles requests from clients



# Content Negotiation



Server-side interpretation of client-provided parameters  
Multiple representations, single resource

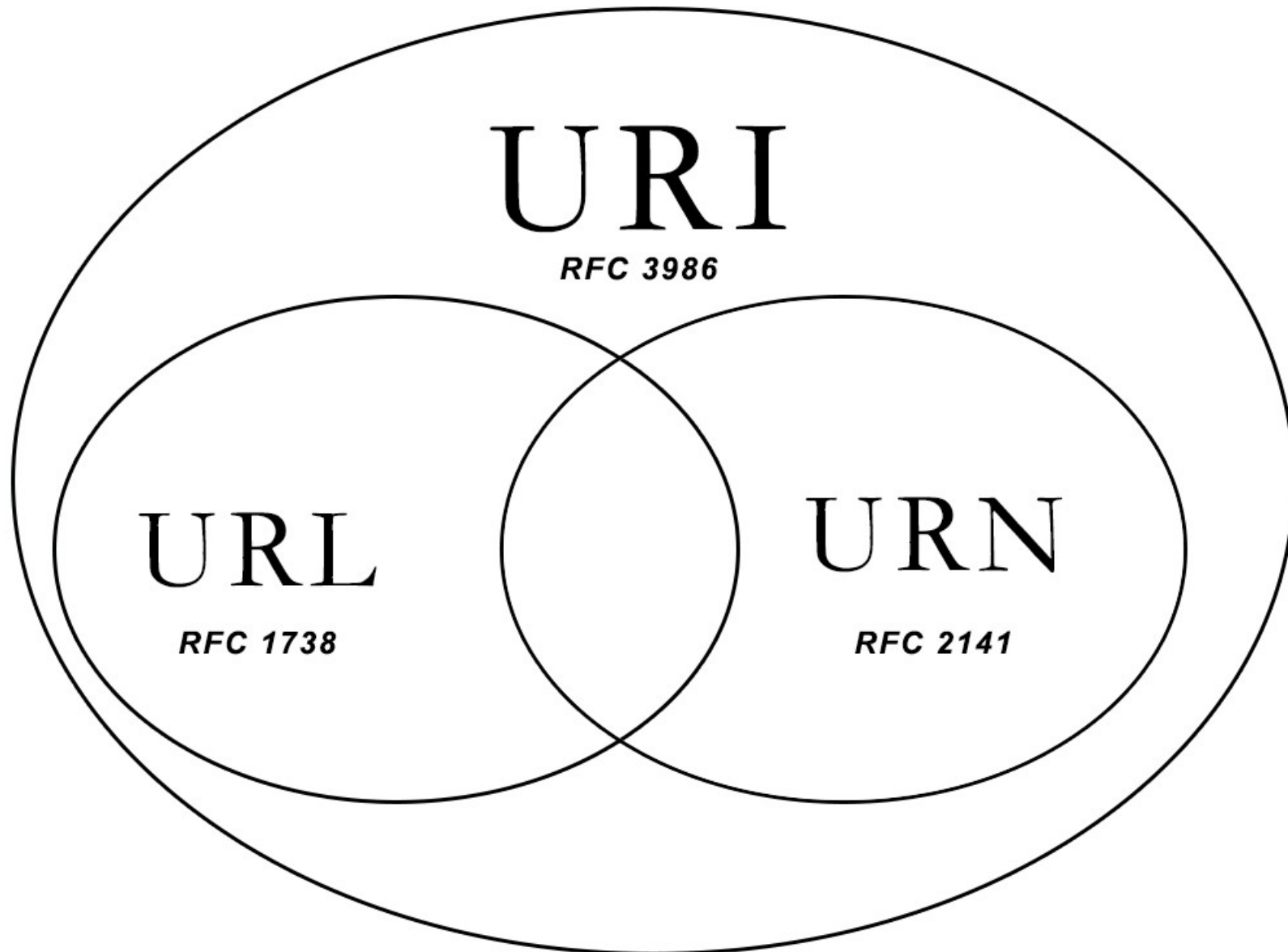
# Content Negotiation Examples

- Accept-Language: en; q=1.0, de; q=0.5
- Accept: text/html; q=1.0, text/\*; q=0.8, image/gif; q=0.6, image/jpeg; q=0.6, image/\*; q=0.5, \*/\*; q=0.1
- Accept-Datetime: Wednesday, 14 January 2015 15:15:00 GMT

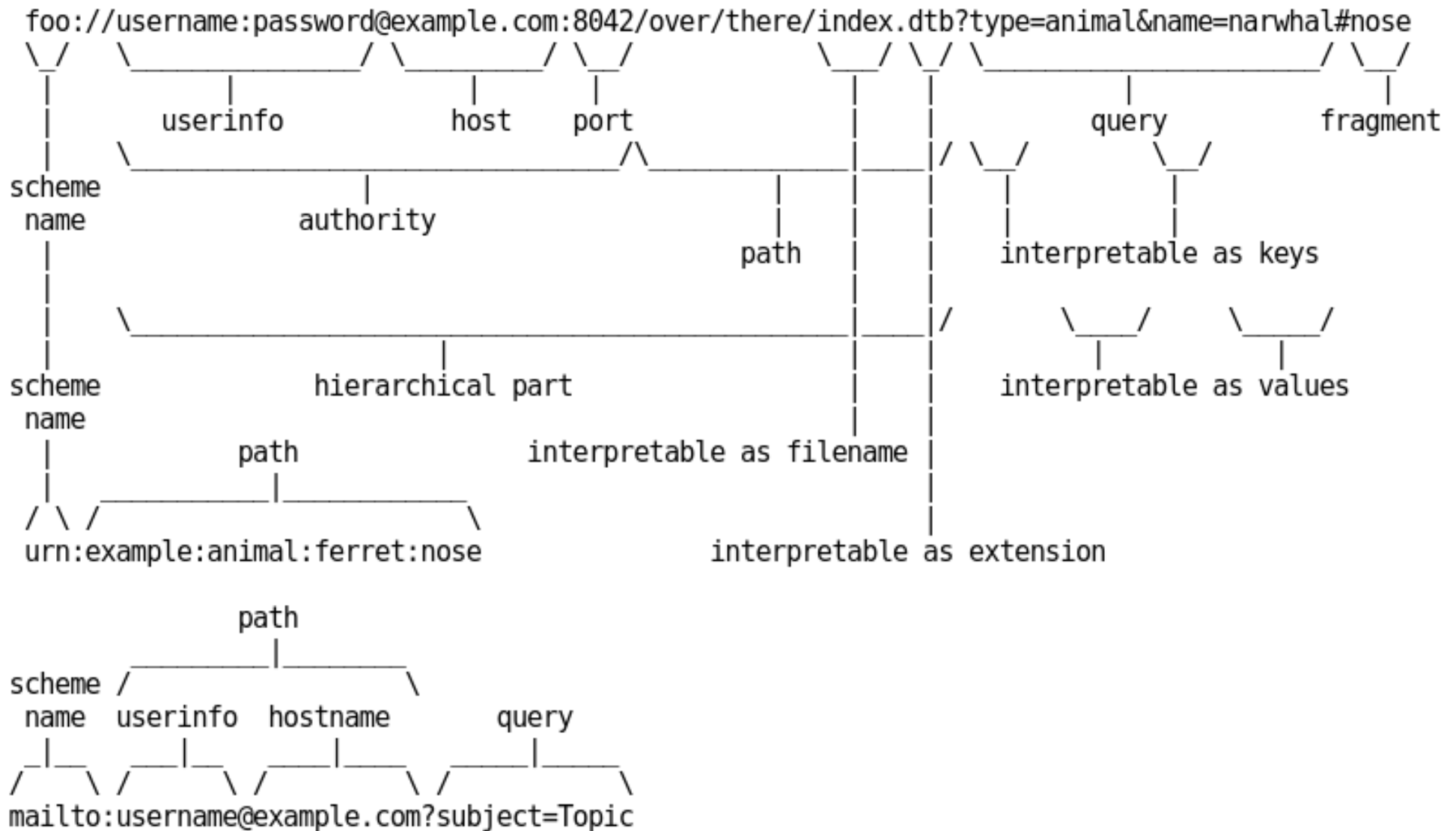
# Identifiers

- Uniform Resource Identifier (URI)
  - <http://www.ietf.org/rfc/rfc2396.txt>
  - <news:comp.infosystems.www.servers.unix>
  - <http://foo.com/page.html#section2>
- Uniform Resource Locator (URL)
  - <http://foo.com/page.html>
- Uniform Resource Name (URN)
  - Unambiguous identifier
  - defines identity (not necessarily location)
  - <urn:isbn:978-0321751041>
  - <foo.com/page.html#section2>

# Identifiers



# URI Schemes



# HTTP – RFC 2616

- Required Reading!
- Describes Hypertext Transfer Protocol structure & dynamics
- Extends RFC 1945 (HTTP/1.0) and RFC 2068 (HTTP/1.1, now obsolete)
- Newer definition for the Web describes URIs, protocols, and formats
- <http://www.w3.org/TR/webarch/>

# Common Response Codes

## § 10.4.5 404 Not Found

The server has not found anything matching the Request-URI. No indication is given of whether the condition is temporary or permanent. The 410 (Gone) status code SHOULD be used if the server knows...that an old resource is permanently unavailable and has no forwarding address

## § 10.3.2 301 Moved Permanently

The requested resource has been assigned a new permanent URI and any future references to this resource SHOULD use one of the returned URIs

## § 10.2.1 200 OK

The request has succeeded. The information returned with the response is dependent on the method used in the request

## § 10.4.6 405 Method Not Allowed

The method specified in the Request-Line is not allowed for the resource identified by the Request-URI.

# HTTP Methods

- GET, HEAD
- TRACE
  - What methods are defined on this URI?
- DELETE
  - Rarely supported for most URIs
- PUT
  - Rarely supported. Equivalent to Unix `$ echo "hello world" > temp.txt`
- POST
  - Frequently used for passing credentials.



Table 7: Summarized Method Support Distribution

<b>Method</b>	<b>RFC</b>	<b>Supported (Count)</b>	<b>Percentage</b>
GET	2616	22899	56.029%
HEAD	2616	22879	55.980%
OPTIONS	2616	22726	55.606%
POST	2616	16497	40.365%
TRACE	2616	14946	36.570%
DELETE	2616	735	1.798%
PUT	2616	696	1.703%
CONNECT	2616	422	1.033%
PROPFIND	2518	1226	3.000%
COPY	2518	1218	2.980%
LOCK	2518	1196	2.926%
UNLOCK	2518	1190	2.912%
MOVE	2518	542	1.326%
PROPPATCH	2518	536	1.311%
MKCOL	2518	523	1.280%
MKDIR	1813	6	0.015%
RMDIR	1813	6	0.015%
PATCH	5789	418	1.023%
REPORT	3253	1	0.002%
ACL	3744	1	0.002%
SEARCH	5323	611	1.495%
INDEX	Unknown	6	0.015%
NNOC	Unknown	1	0.002%