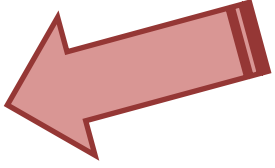


Overall functioning of HTTP clients: requests submission and responses processing

Web Engineering

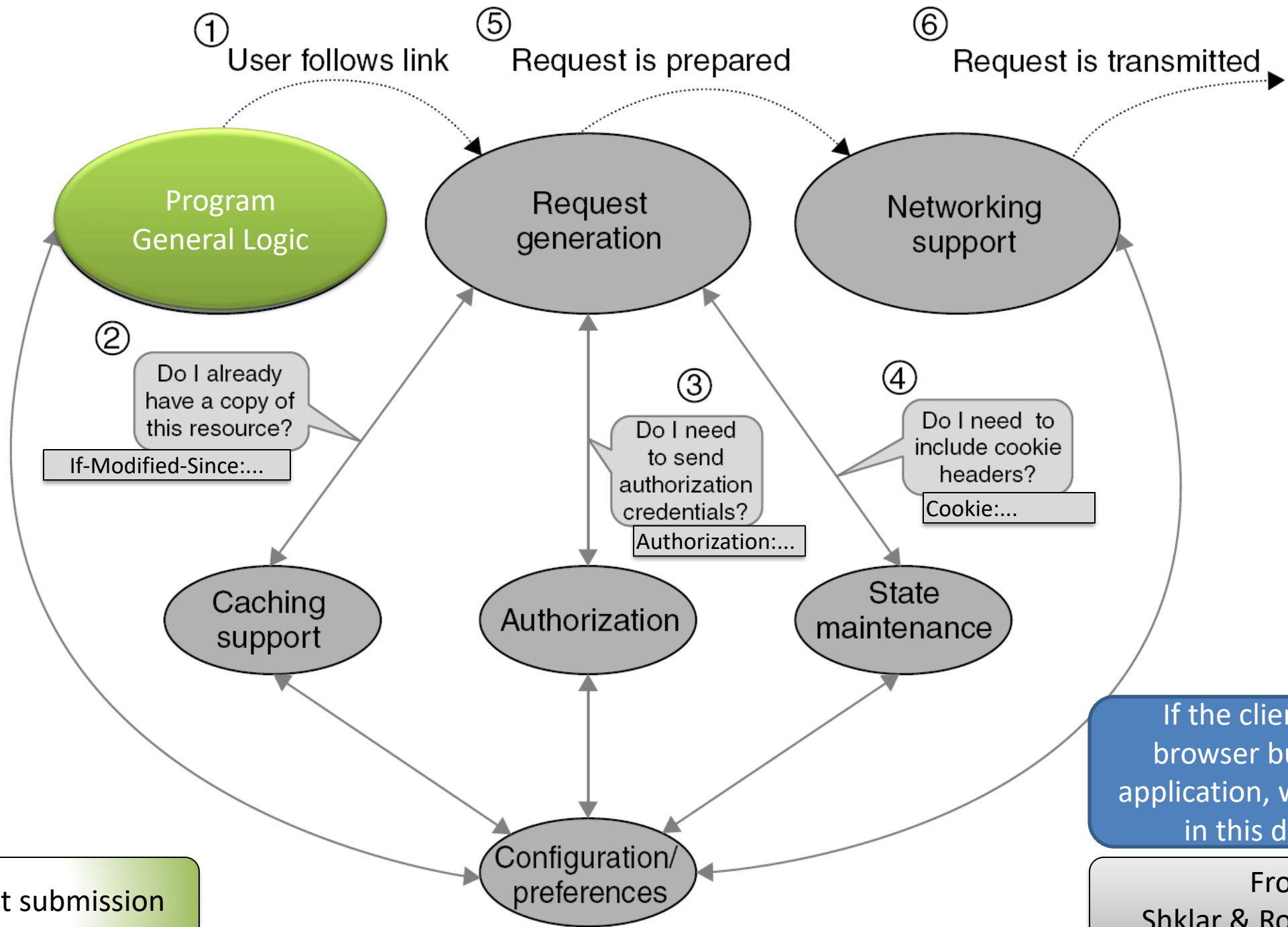
What is an HTTP client?
What types are most common?

1. Browsers 
2. Web servers that make requests to other servers
3. Code in any application (web or not) that contacts an HTTP server



Basically,
what does a browser do?

1. Sends HTTP requests to servers on your behalf or on its own initiative.
2. Receives HTTP responses from servers and interprets them.
3. Acts with the outcome of the interpretation (eg., Showing the results in the browser window).



HTTP request submission

What HTTP request is made to display the image?
What request is made when you click on the link?



Photo by Robin Mathews

```

```

```
<a href="talk.html">Talk with Terry Pratchett</a>
```

Terry Pratchett is a British author of humorous fantasy novels. He appeared in 1983 in the *New York Times* and *London Times*. He has been a publisher for many years as a journalist and press officer, writing in his spare time and publishing a number of novels, including his first Discworld novel, **The Color of Magic**, in 1983. In 1987 he turned to writing full time, and has not looked back since. To date there are a total of 36 books in the Discworld series, of which four (so far) are written for children. The first of these, **The Amazing Maurice and His Educated Rodents**, won the Carnegie Medal. A non-Discworld book, **Good Omens**, his 1990 collaboration with Neil Gaiman, has been a longtime bestseller, and was reissued in hardcover by William Morrow in early 2006 (it is also available in paperback).

His latest book, **Making Money**, was published in September 2007 and was an instant *New York Times* and *London Times* bestseller. In 2008, Harper Children's will publish Terry's new

Second Life Q&A

**Sign up for
Terry Pratchett
& Discworld News**

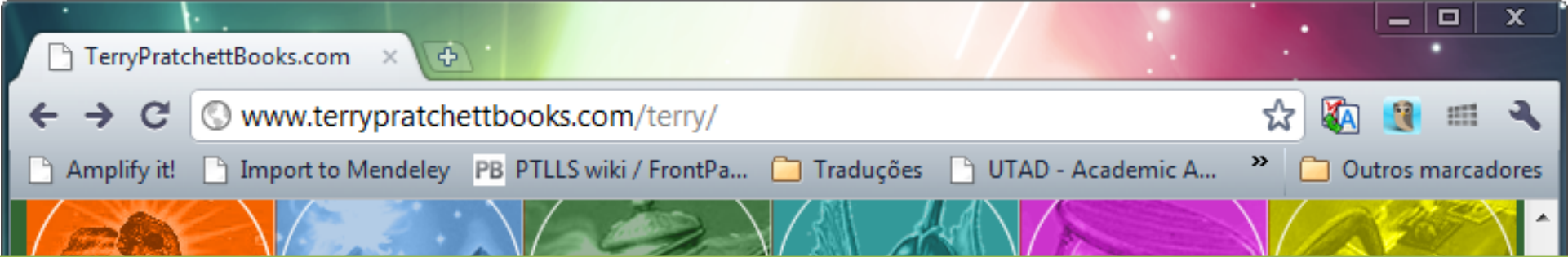
Praise for Pratchett

**Locus Magazine
Interview**

About Paul Kidby

Talk with Terry Pratchett

A Message from Terry Pratchett



Originates this HTTP request... Why? (As soon as the page loads, of course.)

GET /img/common/terry-big.jpg HTTP/1.1

Host:www.terrypratchettbooks.com



Photo by Robin Mathews

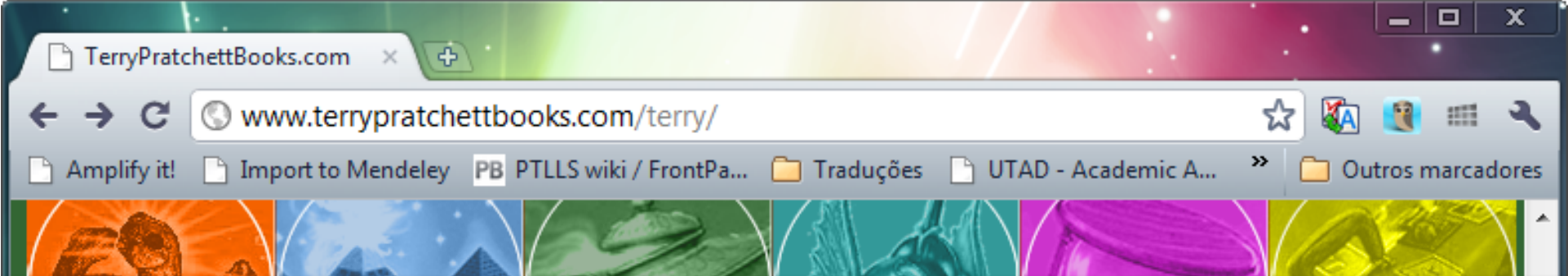
series, of which four (so far) are written for children. The first of these, **The Amazing Maurice and His Educated Rodents**, won the Carnegie Medal. A non-Discworld book, **Good Omens**, his 1990 collaboration with Neil Gaiman, has been a longtime bestseller, and was reissued in hardcover by William Morrow in early 2006 (it is also available as a mass market paperback (Harper Torch, 2006) and trade paperback (Harper Paperbacks, 2006). Terry's latest book, **Making Money**, was published in September 2007 and was an instant *New York Times* and *London Times* bestseller. In 2008, Harper Children's will publish Terry's new

[Interview](#)

[About Paul Kidby](#)

[Talk with Terry Pratchett](#)

[A Message from Terry Pratchett](#)



And if it was ...

What would originate?



Photo by Robin Mathews

Smythe. Terry worked for many years as a journalist and press officer, writing in his spare time and publishing a number of novels, including his first Discworld novel, **The Color of Magic**, in 1983. In 1987 he turned to writing full time, and has not looked back since. To date there are a total of 36 books in the Discworld series, of which four (so far) are written for children. The first of these, **The Amazing Maurice and His Educated Rodents**, won the Carnegie Medal. A non-Discworld book, **Good Omens**, his 1990 collaboration with Neil Gaiman, has been a longtime bestseller, and was reissued in hardcover by William Morrow in early 2006 (it is also available as a mass market paperback (Harper Torch, 2006) and trade paperback (Harper Paperbacks, 2006). Terry's latest book, **Making Money**, was published in September 2007 and was an instant *New York Times* and *London Times* bestseller. In 2008, Harper Children's will publish Terry's new

[Sign up for Terry Pratchett & Discworld News](#)

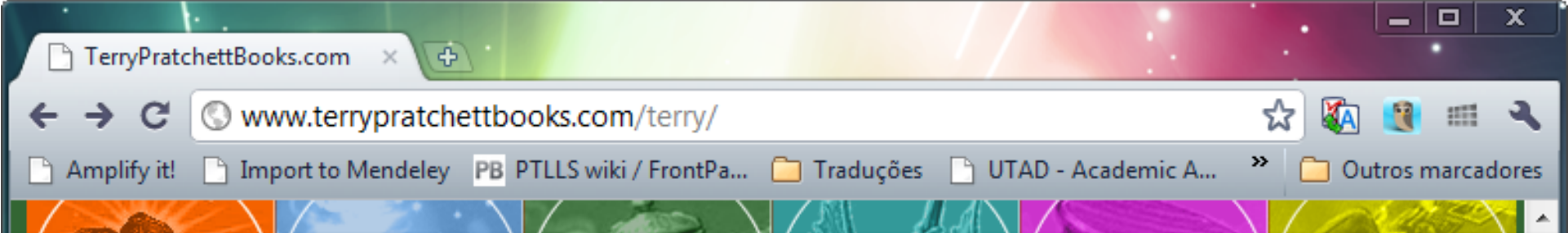
[Praise for Pratchett](#)

[Locus Magazine Interview](#)

[About Paul Kidby](#)

[Talk with Terry Pratchett](#)

[A Message from Terry Pratchett](#)



If it were...

```

```

It would originate this ... Why?

GET /terry/img/common/terry-big.jpg HTTP/1.1
Host:www.terrypratchettbooks.com



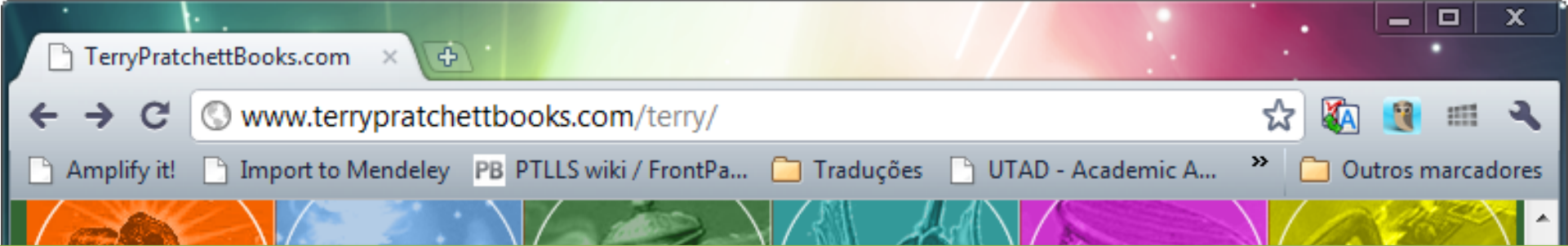
Photo by Robin Mathews

children. The first of these, **The Amazing Maurice and His Educated Rodents**, won the Carnegie Medal. A non-Discworld book, **Good Omens**, his 1990 collaboration with Neil Gaiman, has been a longtime bestseller, and was reissued in hardcover by William Morrow in early 2006 (it is also available as a mass market paperback (Harper Torch, 2006) and trade paperback (Harper Paperbacks, 2006). Terry's latest book, **Making Money**, was published in September 2007 and was an instant *New York Times* and *London Times* bestseller. In 2008, Harper Children's will publish Terry's new

About Paul Kidby

Talk with Terry Pratchett

A Message from Terry Pratchett



`Talk with Terry Pratchett`

Originates this HTTP request... Why? (Only when clicking, of course ...)

GET /terry/talk.html HTTP/1.1

Host:www.terrypratchettbooks.com



Photo by Robin Mathews

series, of which four (so far) are written for children. The first of these, **The Amazing Maurice and His Educated Rodents**, won the Carnegie Medal. A non-Discworld book, **Good Omens**, his 1990 collaboration with Neil Gaiman, has been a longtime bestseller, and was reissued in hardcover by William Morrow in early 2006 (it is also available as a mass market paperback (Harper Torch, 2006) and trade paperback (Harper Paperbacks, 2006). Terry's latest book, **Making Money**, was published in September 2007 and was an instant *New York Times* and *London Times* bestseller. In 2008, Harper Children's will publish Terry's new

Locus Magazine Interview

About Paul Kidby

Talk with Terry Pratchett

A Message from Terry Pratchett



Pay attention to <base> HTML element

The `<base>` tag specifies the base URL and/or target for all relative URLs in a document.

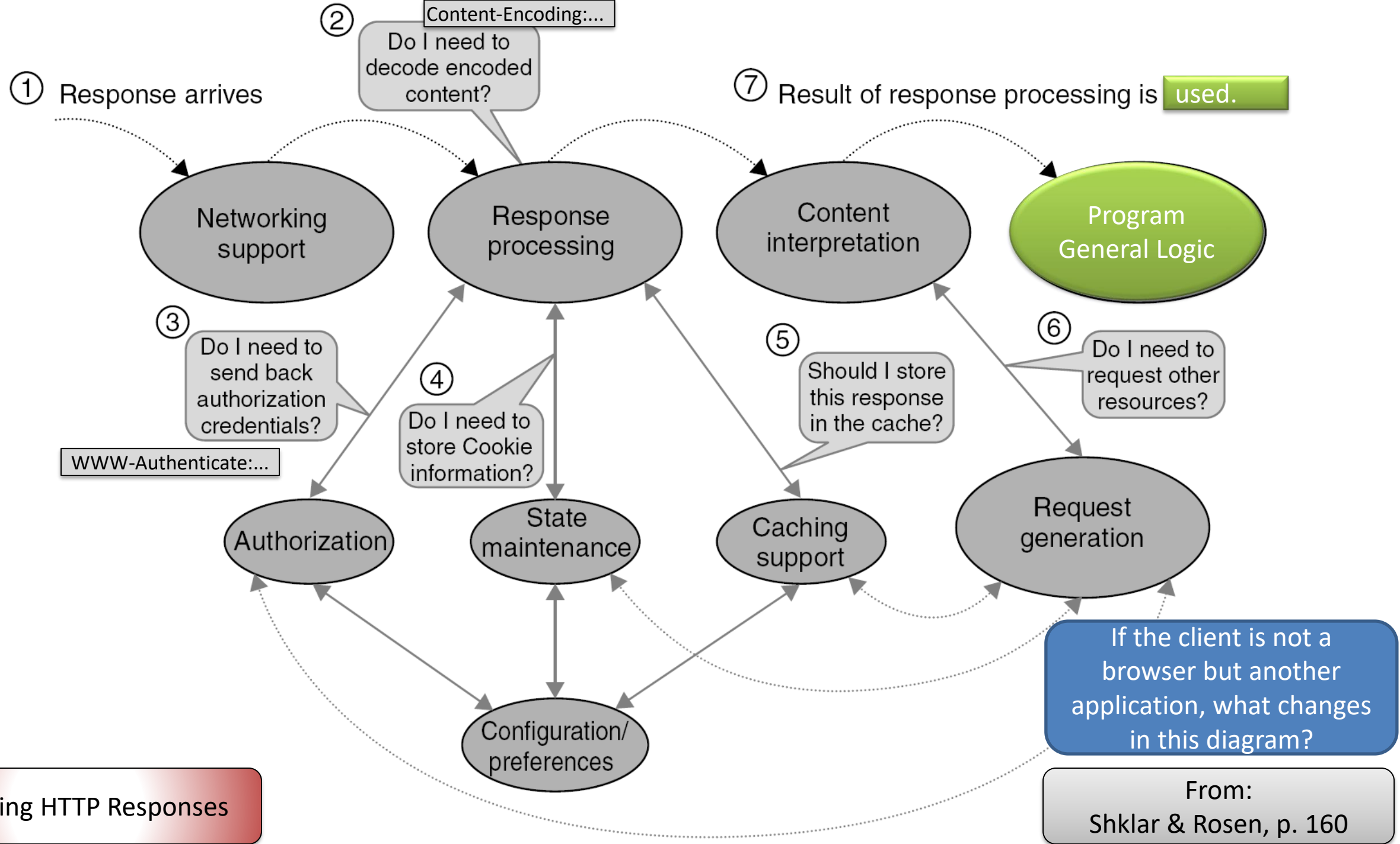
The `<base>` tag must have either an href or a target attribute present, or both.

There can only be one single `<base>` element in a document, and it must be inside the `<head>` element.

```
<head>
  <base href="https://www.w3schools.com/" target="_blank">
</head>

<body>


<a href="tags/tag_base.asp">HTML base Tag</a>
</body>
```



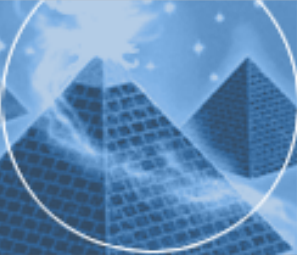
TerryPratchettBooks.com

www.terrypratchettbooks.com/terry/


Amplify it! Import to Mendeley PB PTLLS wiki / FrontPa... Traduções UTAD - Academic A... Outros marcadores




Discworld




Books




Meet Terry



News



Msg Boards



Linx

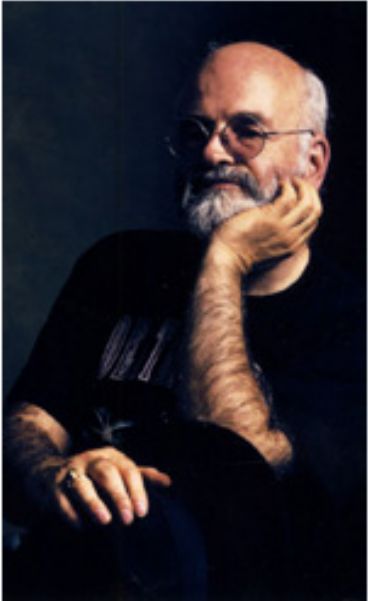


Photo by Robin Mathews

Terry Pratchett sold his first story when he was thirteen, which earned him enough money to buy a second-hand typewriter. His first novel, a humor...

appea...

Smyt...

jour...

time...

includ...

Magi

time, and has not looked back since. To date there are a total of 36 books in the Discworld series, of which four (so far) are written for children. The first of these, **The Amazing Maurice and His Educated Rodents**, won the Carnegie Medal. A non-Discworld book, **Good Omens**, his 1990 collaboration with Neil Gaiman, has been a longtime bestseller, and was reissued in hardcover by William Morrow in early 2006 (it is also available as a mass market paperback (Harper Torch, 2006) and trade paperback (Harper Paperbacks, 2006). Terry's latest book, **Making Money**, was published in September 2007 and was an instant *New York Times* and *London Times* bestseller. In 2008, Harper Children's will publish Terry's new

< Meet Terry

Let's take a look at the response processing for this page.

Locus Magazine Interview

About Paul Kidby

Talk with Terry Pratchett

A Message from Terry Pratchett

HTTP/1.1 200 OK
Date: Tue, 12 Oct 2010 12:28:34 GMT
Server: Apache/1.3.31 (Unix) PHP/4.3.8 mod_ssl/2.8.19 OpenSSL/0.9.7d
Last-Modified: Wed, 29 Oct 2008 17:38:03 GMT
Etag: "21b019-2288-49089f7b"
Accept-Ranges: bytes
Content-Length: 8914
Keep-Alive: timeout=15, max=100
Connection: Keep-Alive
Content-Type: text/html

```
<html><script src="/A2EB891D63C8/avg_ls_dom.js" type="text/javascript"></script>
<head>
  <meta name="generator" content=
    "HTML Tidy for Mac OS, see www.w3.org">

  <title>TerryPratchettBooks.com</title>
  <link rel="stylesheet" type="text/css" href="../css/type.css">
<script language="JavaScript" type="text/javascript" src=
  "../js/menu-roll.js">
</script>
  <meta http-equiv="Content-Type" content=
    "text/html; charset=iso-8859-1">
</head>

<body bgcolor="#336633" text="#000000" link="#FF6600" vlink=
  "#FF0000" alink="#999999" leftmargin="8" marginwidth="8"
  topmargin="8" marginheight="8" onload="menuflag=1;">
  <table width="750" border="0" cellpadding="0" cellspacing="0"
    summary="layout">
```

Times and London Times bestseller. In 2008,
Harper Children's will publish Terry's new

The screenshot shows a web browser window with a dark theme. The address bar displays "Academic A..." and "Outros marcadores". The page content features a diagram titled "Recepção de respostas HTTP" (Reception of HTTP responses) and a list of links.

Diagram: Recepção de respostas HTTP

The diagram illustrates the flow of an HTTP response from the network to the user. It includes the following components and steps:

- Networking support**: The initial point where the response arrives.
- Response processing**: The central hub for handling the response.
- Content interpretation**: The step where the content is decoded and interpreted.
- Presentation**: The final step where the result is presented to the user.
- Authorization**: A step that checks if the user needs to send back authorization credentials.
- State maintenance**: A step that checks if the user needs to store Cookie information.
- Caching support**: A step that checks if the user should store the response in the cache.
- Request generation**: A step that checks if the user needs to request other resources.
- Configuration/preferences**: A step that manages the user's configuration and preferences.

The diagram is numbered 1 through 7, indicating the sequence of operations.

Links:

- Locus Magazine Interview
- About Paul Kidby
- Talk with Terry Pratchett
- A Message from Terry Pratchett

De: Shklar & Rosen, p. 160

TerryPratchettBooks.com - Mozilla Firefox

File Edit View History Delicious Bookmarks Tools Help

http://www.terrypratchettbooks.com/terry/

Most Visited Getting Started Latest Headlines MUVEnation Microsoft Language P...

Recently Bookmarked Microsoft Language P... </tr><tr><td>Accept-Encoding</td><td>gzip,deflate</td><td>Accept-Ranges</td><td>bytes</td></tr><tr><td>Accept-Charset</td><td>ISO-8859-1,utf-8;q=0.7,*;q=0.7</td><td>Content-Length</td><td>8914</td></tr><tr><td>Keep-Alive</td><td>115</td><td>Keep-Alive</td><td>timeout=15, max=100</td></tr><tr><td>Connection</td><td>keep-alive</td><td>Connection</td><td>Keep-Alive</td></tr><tr><td></td><td></td><td>Content-Type</td><td>text/html</td></tr></table> | | | | | Request Header | Value | Response Header | Value | (Request-Line) | GET /terry/ HTTP/1.1 | (Status-Line) | HTTP/1.1 200 OK | Host | www.terrypratchettbooks.com | Date | Tue, 12 Oct 2010 12:28:34 GMT | User-Agent | Mozilla/5.0 (Windows; U; Windows NT 6.0; en-US; rv:1.9.2.6) Gecko/20100625 Firefox/3.6.6 (.NET CLR 3.5.30729; .NET4.0E) | Server | Apache/1.3.31 (Unix) PHP/4.3.8 mod_ssl/2.8.19 OpenSSL/0.9.7d | Accept | text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8 | Last-Modified | Wed, 29 Oct 2008 17:38:03 GMT | Accept-Language | en-us,en;q=0.5 | Etag | "21b019-2288-49089f7b" | Accept-Encoding | gzip,deflate | Accept-Ranges | bytes | Accept-Charset | ISO-8859-1,utf-8;q=0.7,*;q=0.7 | Content-Length | 8914 | Keep-Alive | 115 | Keep-Alive | timeout=15, max=100 | Connection | keep-alive | Connection | Keep-Alive | | | Content-Type | text/html |
Request Header	Value	Response Header	Value																																													
(Request-Line)	GET /terry/ HTTP/1.1	(Status-Line)	HTTP/1.1 200 OK																																													
Host	www.terrypratchettbooks.com	Date	Tue, 12 Oct 2010 12:28:34 GMT																																													
User-Agent	Mozilla/5.0 (Windows; U; Windows NT 6.0; en-US; rv:1.9.2.6) Gecko/20100625 Firefox/3.6.6 (.NET CLR 3.5.30729; .NET4.0E)	Server	Apache/1.3.31 (Unix) PHP/4.3.8 mod_ssl/2.8.19 OpenSSL/0.9.7d																																													
Accept	text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8	Last-Modified	Wed, 29 Oct 2008 17:38:03 GMT																																													
Accept-Language	en-us,en;q=0.5	Etag	"21b019-2288-49089f7b"																																													
Accept-Encoding	gzip,deflate	Accept-Ranges	bytes																																													
Accept-Charset	ISO-8859-1,utf-8;q=0.7,*;q=0.7	Content-Length	8914																																													
Keep-Alive	115	Keep-Alive	timeout=15, max=100																																													
Connection	keep-alive	Connection	Keep-Alive																																													
		Content-Type	text/html																																													

TerryPratchettBooks.com - Mozilla Firefox
File Edit View History Delicious Bookmarks Tools Help

HTTP/1.1 200 OK
Date: Tue, 12 Oct 2010 12:28:34 GMT
Server: Apache/1.3.31 (Unix) PHP/4.3.8
mod_ssl/2.8.19 OpenSSL/0.9.7d
Last-Modified: Wed, 29 Oct 2008 17:38:03 GMT
Etag: "21b019-2288-49089f7b"
Accept-Ranges: bytes
Content-Length: 8914
Keep-Alive: timeout=15, max=100
Connection: Keep-Alive
Content-Type: text/html

<html><script
src="/A2EB891D63C8/avg_ls_dom.js"
type="text/javascript"></script>
<head>
 <meta name="generator" content=
 "HTML Tidy for Mac OS, see www.w3.org">

 <title>TerryPratchettBooks.com</title>
 <link rel="stylesheet" type="text/css"
 href="../css/type.css">
 <script language="JavaScript"
 type="text/javascript" src=
 "./js/menu-roll.js">
 </script>
 <meta http-equiv="Content-Type" content=
 "text/html; charset=iso-8859-1">
</head>

00:01:05.869 0.730 419 6263 GET 200
text/html
http://www.terrypratchettbooks.com/terry/
00:01:06.216 0.231 431 10859 GET
200 text/javascript
http://www.terrypratchettbooks.com/A2EB89
1D63C8/avg_ls_dom.js
00:01:06.264 0.355 432 2143 GET 200
text/css
http://www.terrypratchettbooks.com/css/type.
css
00:01:06.272 0.361 420 1770 GET 200
application/x-javascript
http://www.terrypratchettbooks.com/js/menu-
roll.js
00:01:06.465 0.409 465 1609 GET 200
image/gif
http://www.terrypratchettbooks.com/img/com
mon/terry-title-off.gif
00:01:06.473 0.415 462 727 GET 200
image/gif
http://www.terrypratchettbooks.com/img/com
mon/terry-select.gif
00:01:06.481 0.659 421 6174 GET 200
application/x-javascript
http://www.terrypratchettbooks.com/js/menu-
books.js
00:01:06.489 0.388 464 506 GET 200
image/gif
http://www.terrypratchettbooks.com/img/com

The c

st

content.

How does the browser act against other non-HTML content?

- CSS
- Javascript
- Images
- Various documents (pdf, docx, xlsx, zip, etc.)
- ...

Helpers and Plugins

Helpers and Plugins

The browser only has the ability to start the **helper application** and display the appropriate file.

A **plug-in** is an application program invoked by the browser. It is a dynamic code module designed to extend the capabilities of the browser by integrating a third-party application program into the browser.

We can force browser do save any content?

or any other content-type...

Content-type: application/octet-stream
Content-Disposition: 'attachment; filename="file.ext"'

~~Content-type: application/octet-stream~~
Content-Type: application/force-download

Resume

HTTP CLIENTS

WHAT ARE AND HOW THEY WORK?

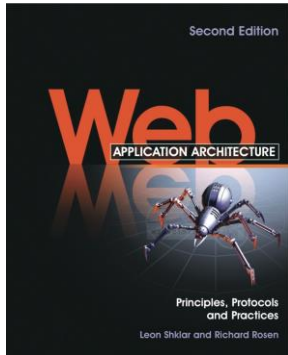
HOW BROWSER GENERATE REQUESTS?

HOW BROWSER PROCESSES RESPONSES?

WHAT ARE HELPERS AND PLUGINS? WHY BROWSER NEED THEM?

Next class

Continuing with HTTP clients



Shklar, Leon & Rosen, Rich (2009). *Web Application Architecture: Principles, Protocols and Practices*. Chichester, Reino Unido: John Wiley & Sons.

Pages: 151 to 174

This is a tilted image of a page from the book, showing the table of contents for Chapter 7, 'Web Browsers'. The page is numbered 7 at the top left. The contents are listed as follows:

- 7.1 Overview of Browser Functionality
- 7.2 Architectural Considerations
- 7.3 Overview of Processing Flow in a Browser
 - 7.3.1 Transmitting a request
 - 7.3.2 Receiving a response
- 7.4 Processing HTTP Requests
 - 7.4.1 Constructing the request line
 - 7.4.2 Constructing the headers
 - 7.4.3 Constructing the request body
 - 7.4.4 Transmitting the request
- 7.5 Processing HTTP Responses
 - 7.5.1 Processing successful responses
 - 7.5.2 Processing responses with other status codes