Part 1

Assuming that the question is talking about evolution of http and browsers, then since HTTP 0.9 was only able to retrieve html documents there would be no way to display any other type of rich file formats such as images.

Also, there was no ability to use cookies in HTTP 0.9 so if you wanted to get the page again you'd have to reload the entire page. There is also no way to avoid having to get the whole file.

Part 2

There is now a header telling me "HTTP/1.1 200 OK". This means that the server can serve up the request formatted as HTTP 1.1 .

I can also see that cookies are being utilized by the lines:

Set-Cookie: phpbb3_loui4_u=1; expires=Sun, 23-Jan-2022 21:51:46 GMT; path=/; secure; HttpOnly
Set-Cookie: phpbb3_loui4_k=; expires=Sun, 23-Jan-2022 21:51:46 GMT; path=/; secure; HttpOnly
Set-Cookie: phpbb3_loui4_sid=06696fd11853b62cca43a93d0cf0bfd9; expires=Sun, 23-Jan-2022 21:51:46 GMT; path=/; secure; HttpOnly

I also see a line describing Cache Control:

Cache-Control: private, no-cache="set-cookie"

Server: Apache/2.4.46 (Ubuntu)

It also tells me that my server is running Apache 2.4.46 Ubuntu.

Part 3

The server is giving me an "HTTP/1.1 301 Moved Permanently" error. It also tells me that the new location is http://localhost/vendor/. So I should have added another forward slash to the end of the directory name.

Once I add a forward slash, it showed me the html code that renders the full directory. When I visit the directory in a browser via http://localhost/vendor/ it shows me the HTML rendered version of the directory with the sub folders and files listed.

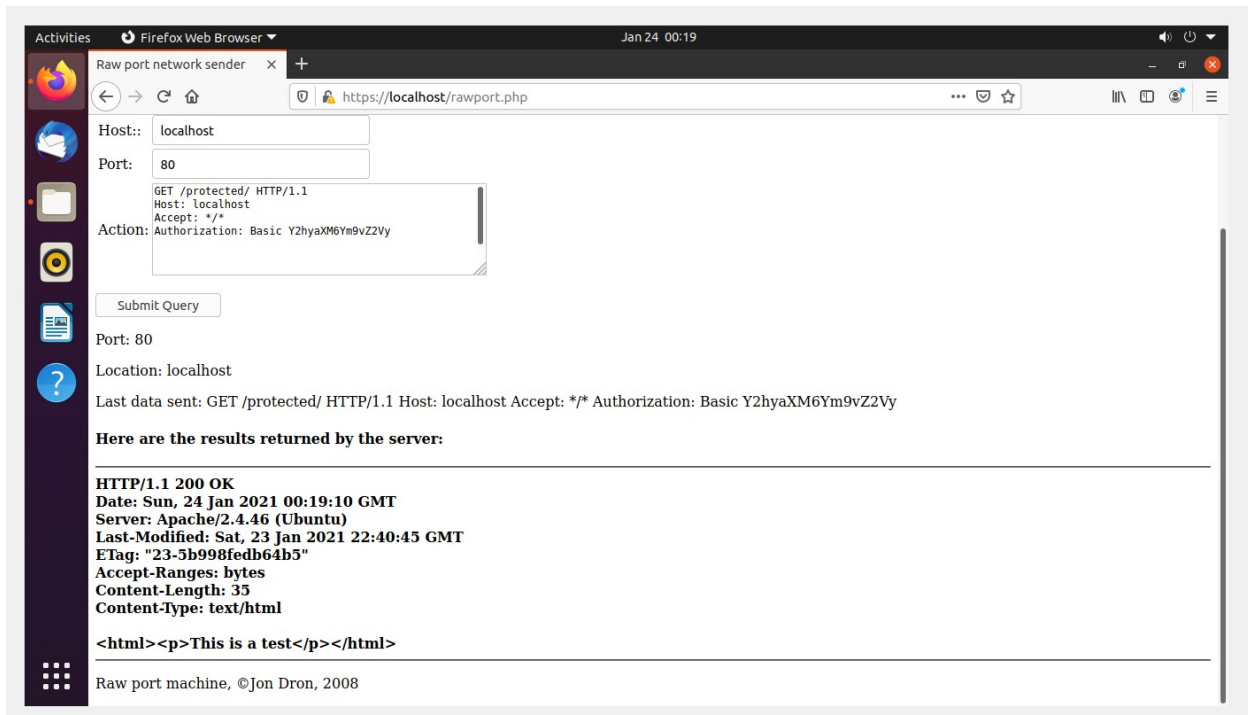It also shows me the header "HTTP/1.1 200 OK".

Part 4

When trying to access the folder, I got an "HTTP/1.1 401 Unauthorized" error. As shown below.
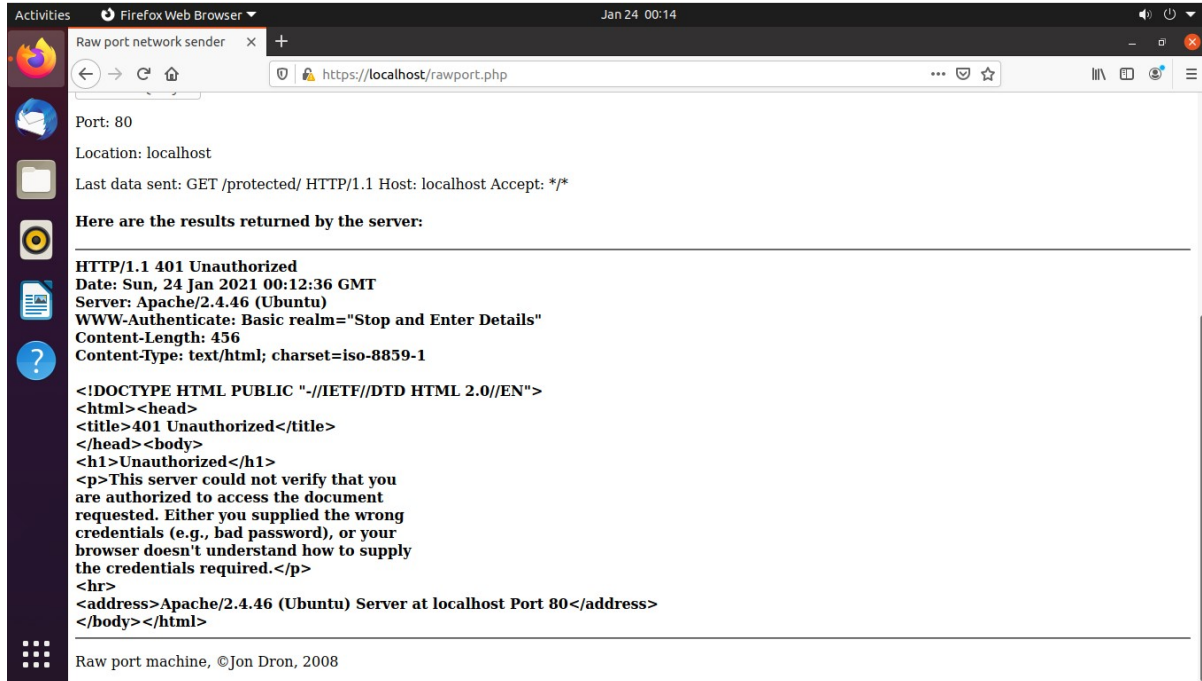
My server is set up to support basic authentication.

Once I typed in the encoded password it showed me the HTTP/1.1 for the site.

The purpose of encoding the username and password is so that non-HTTP compatible characters that are included in the username and password are encoded into HTTP-compatible characters.

Part 5

When trying to access https://localhost/nosuchfileexists.html I receive an "HTTP/1.1 404 Not Found" error. Which makes absolute sense because there are no files named nosuchfileexists in that directory. I have seen this before on websites that try to link to an older page on the site that no longer exists.

Action:
```
GET /nosuchfileexists.html HTTP/1.1
Host: localhost
Accept: */*
```

Submit Query

Port: 80

Location: localhost

Last data sent: GET /nosuchfileexists.html HTTP/1.1 Host: localhost Accept: */*

Here are the results returned by the server:

```
HTTP/1.1 404 Not Found
Date: Sun, 24 Jan 2021 20:33:18 GMT
Server: Apache/2.4.46 (Ubuntu)
Content-Length: 271
Content-Type: text/html; charset=iso-8859-1

<!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML 2.0//EN">
<html><head>
<title>404 Not Found</title>
</head><body>
<h1>Not Found</h1>
<p>The requested URL was not found on this server.</p>
<hr>
<address>Apache/2.4.46 (Ubuntu) Server at localhost Port 80</address>
</body></html>
```

Raw port machine ©Ian Dron 2008

Part 6

When I changed it to "Accept: text/*" it still showed the content type as image/jpeg. I checked the MIME Types in apache and found the type "image/jpeg" was set to the file extension ".jpeg". So that should have worked. Then I tried going into the folder that the jpeg file was in and added a .htaccess file and in that .htaccess file I specified the "AddType" directive to be "image/jpeg". For some reason, in the server configuration there is an incorrect setting that does not filter the correct MIME type. I couldn't find that configuration.

Port: 80

Location: localhost

Last data sent: GET /bird.jpeg HTTP/1.1 Host: localhost Accept: */*

Here are the results returned by the server:

HTTP/1.1 200 OK
Date: Sun, 24 Jan 2021 20:52:22 GMT
Server: Apache/2.4.46 (Ubuntu)
Last-Modified: Sun, 24 Jan 2021 20:51:54 GMT
ETag: "db87-5b9ab976cfcbe"
Accept-Ranges: bytes
Content-Length: 56199
Content-Type: image/jpeg

RC<textCopyright (c) 1998 Hewlett-Packard CompanydescsRGB IEC61966-2.1sRGB IEC61966-2.1desc.IEC 61966-2.1 Default RGB colour space - sRGB.IEC 61966-2.1 Default RGB colour space - sRGBdesc,Reference Viewing Condition in IEC61966-2.1,Reference Viewing Condition in IEC61966-2.1

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Part 7

Without making a change to the html file but resubmitting the query, the head tag did not change.

Host:: localhost

Port: 80

Action:
```
HEAD /test/testing.html HTTP/1.1
Host: localhost
```

Submit Query

Port: 80

Location: localhost

Last data sent: HEAD /test/testing.html HTTP/1.1 Host: localhost

Here are the results returned by the server:

HTTP/1.1 200 OK
Date: Sun, 24 Jan 2021 22:18:48 GMT
Server: Apache/2.4.46 (Ubuntu)
Last-Modified: Sun, 24 Jan 2021 22:17:40 GMT
ETag: "38-5b9acca21a69a"
Accept-Ranges: bytes
Content-Length: 56
Content-Type: text/html

But when making the change to the html file, the ETag changed.

Host:: localhost

Port: 80

Action:
```
HEAD /test/testing.html HTTP/1.1
Host: localhost
```

[Submit Query]

Port: 80

Location: localhost

Last data sent: HEAD /test/testing.html HTTP/1.1 Host: localhost

Here are the results returned by the server:

HTTP/1.1 200 OK
Date: Sun, 24 Jan 2021 22:20:05 GMT
Server: Apache/2.4.46 (Ubuntu)
Last-Modified: Sun, 24 Jan 2021 22:19:58 GMT
ETag: "49-5b9acd25803e9"
Accept-Ranges: bytes
Content-Length: 73
Vary: Accept-Encoding
Content-Type: text/html

When I successfully found the name and version of the web server for the site en.wikipedia.org.

Action:
```
Accept: */*
```

[Submit Query]

Port: 80

Location: en.wikipedia.org

Last data sent: HEAD /wiki/Main_page HTTP/1.1 Host: en.wikipedia.org Accept: */*

Here are the results returned by the server:

HTTP/1.1 301 TLS Redirect
Date: Sun, 24 Jan 2021 22:52:12 GMT
Server: Varnish
X-Varnish: 981250895
X-Cache: cp1087 int
X-Cache-Status: int-front
Server-Timing: cache;desc="int-front"
Set-Cookie: WMF-Last-Access=24-Jan-2021;Path=/;HttpOnly;secure;Expires=Thu, 25 Feb 2021 12:00:00 GMT
Set-Cookie: WMF-Last-Access-Global=24-Jan-2021;Path=/;Domain=.wikipedia.org;HttpOnly;secure;Expires=Thu, 25 Feb 2021 12:00:00 GMT
X-Client-IP: 135.23.58.217
Location: https://en.wikipedia.org/wiki/Main_page
Content-Length: 0
Connection: keep-alive

Part 8

I did see a different webpage for each host.

First virtual host:

Host:: localhost

Port: 80

Action:
```
Get / HTTP/1.1
Host: localhost
Accept: */*
```

[Submit Query]

Port: 80

Location: localhost

Last data sent: Get / HTTP/1.1 Host: localhost Accept: */*

Here are the results returned by the server:

```
HTTP/1.1 200 OK
Date: Mon, 25 Jan 2021 00:05:02 GMT
Server: Apache/2.4.46 (Ubuntu)
Set-Cookie: phpbb3_loui4_u=1; expires=Tue, 25-Jan-2022 00:05:02 GMT; path=/; secure; HttpOnly
Set-Cookie: phpbb3_loui4_k=; expires=Tue, 25-Jan-2022 00:05:02 GMT; path=/; secure; HttpOnly
Set-Cookie: phpbb3_loui4_sid=72f0be3ef3c73abe813ff67804e3f71e; expires=Tue, 25-Jan-2022 00:05:02 GMT; path=/; secure; HttpOnly

Cache-Control: private, no-cache="set-cookie"
Expires: Mon, 25 Jan 2021 00:05:02 GMT
Referrer-Policy: strict-origin-when-cross-origin
Vary: Accept-Encoding
Transfer-Encoding: chunked
Content-Type: text/html; charset=UTF-8

34f4
<!DOCTYPE html>
<html dir="ltr" lang="en-gb">
<head>
<meta charset="utf-8" />
<meta http-equiv="X-UA-Compatible" content="IE=edge">
<meta name="viewport" content="width=device-width, initial-scale=1" />

<title>CRCA - Canadian Rock Climbers Association - Index page</title>

<link rel="alternate" type="application/atom+xml" title="Feed - CRCA - Canadian Rock Climbers Association" href="/app.php/feed?sid=72f0be3ef3c73abe813ff67804e3f71e"> <link rel="alternate"
```

Second virtual host:

Raw port machine

A quick and dirty application by Jon Dron. Treat this code as public domain - you can do anything you like with it!

Note that it is a little delicate - if there are any errors in what you type, it will either hang or give you an obscure error code. Feel free to improve on it if you like and, if it seems useful, post your changes to the course wiki

Host:: 192.168.111.124

Port: 80

Action:
```
GET / HTTP/1.1
Host: 192.168.111.124
Accept: */*
```

[Submit]

Port: 80

Location: 192.168.111.124

Last data sent: GET / HTTP/1.1 Host: 192.168.111.124 Accept: */*

Here are the results returned by the server:

```
HTTP/1.1 200 OK
Date: Mon, 25 Jan 2021 01:12:53 GMT
Server: Apache/2.4.46 (Ubuntu)
Last-Modified: Sun, 24 Jan 2021 23:19:31 GMT
ETag: "35-5b9ada75d6bcb"
Accept-Ranges: bytes
Content-Length: 53
Content-Type: text/html

<html>
<p>This is my new host home page.</p>
</html>
```

Raw port machine, ©Jon Dron, 2008

Part 9

The page did try to send me a cookie that I saw in the header when trying to visit my sites login page. The expiry and path variables are being set in this cookie.

Port: [80]

Action:
```
HEAD /ucp.php?mode=login&redirect=index.php
HTTP/1.1
Host: localhost
Accept: */*
```

[Submit Query]

Port: 80

Location: localhost

Last data sent: HEAD /ucp.php?mode=login&redirect=index.php HTTP/1.1 Host: localhost Accept: */*

Here are the results returned by the server:

HTTP/1.1 200 OK
Date: Sun, 24 Jan 2021 22:59:05 GMT
Server: Apache/2.4.46 (Ubuntu)
Set-Cookie: phpbb3_loui4_u=1; expires=Mon, 24-Jan-2022 22:59:05 GMT; path=/; secure; HttpOnly
Set-Cookie: phpbb3_loui4_k=; expires=Mon, 24-Jan-2022 22:59:05 GMT; path=/; secure; HttpOnly
Set-Cookie: phpbb3_loui4_sid=5e594389d4912ff50d1c436228541c23; expires=Mon, 24-Jan-2022 22:59:05 GMT; path=/; secure; HttpOnly

Cache-Control: private, no-cache="set-cookie"
Expires: Sun, 24 Jan 2021 22:59:05 GMT
Referrer-Policy: strict-origin-when-cross-origin
Content-Type: text/html; charset=UTF-8