

http://

Multimedia Design 2
Week 7

What is HTTP

- HyperText Transfer Protocol
- Proposed in 1990 by Tim Berners-Lee
- Delivers web pages, feeds, podcasts, iPhone apps, etc.
- One of many internet protocols

The one regret

If he were to do it over again today, would he do anything differently? Any regrets?

Mr. Berners-Lee smiled and admitted he might make one change — a small one. He would get rid of the double slash “//” after the “http:” in Web addresses.

— The New York Times Oct 12, 2009

HTTP is how you get stuff on the web



How you *actually* get stuff

```
GET / HTTP/1.1
Host: www.google.com
User-Agent: Mozilla/5.0 (Macintosh; U; Intel Mac OS X 10.6; en-US;...
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: en-us,en;q=0.5
Accept-Encoding: gzip,deflate
Accept-Charset: ISO-8859-1,utf-8;q=0.7,*;q=0.7
Keep-Alive: 300
Connection: keep-alive
Cookie: PREF=ID=1b1e370406541f31:U=cbfc7563400e91be:LD=en:NR=10:TM=12546...

HTTP/1.x 200 OK
Date: Sun, 18 Oct 2009 23:43:31 GMT
Expires: -1
Cache-Control: private, max-age=0
Content-Type: text/html; charset=UTF-8
Content-Encoding: gzip
Server: gws
Content-Length: 3533
X-XSS-Protection: 0
```



The request

```
GET / HTTP/1.1
Host: www.google.com
User-Agent: Mozilla/5.0 (Macintosh; U; Intel Mac OS X 10.6; en-US;...
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
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```

Initiated by a browser, the web client



The response

```
GET / HTTP/1.1
Host: www.google.com
User-Agent: Mozilla/5.0 (Macintosh; U; Intel Mac OS X 10.6; en-US;...
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: en-us,en;q=0.5
Accept-Encoding: gzip,deflate
Accept-Charset: ISO-8859-1,utf-8;q=0.7,*;q=0.7
Keep-Alive: 300
Connection: keep-alive
Cookie: PREF=ID=1b1e370406541f31:U=cbfc7563400e91be:LD=en:NR=10:TM=12546...
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Content-Encoding: gzip
Server: gws
Content-Length: 3533
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```

The site's **web server** decides how to treat the request

Headers

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User-Agent: Mozilla/5.0 (Macintosh; U; Intel Mac OS X 10.6; en-US;...
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: en-us,en;q=0.5
Accept-Encoding: gzip,deflate
Accept-Charset: ISO-8859-1,utf-8;q=0.7,*;q=0.7
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HTTP/1.x 200 OK

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X-XSS-Protection: 0
```

Both the request and response include headers of the form `key: value`

Request method



GET / HTTP/1.1

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Content-Length: 3533

X-XSS-Protection: 0

**GET and POST are the two
request methods we will use**

GET

HEAD

POST

TRACE

PUT

OPTIONS

DELETE

CONNECT

Request path

GET / HTTP/1.1

Host: www.google.com

User-Agent: Mozilla/5.0 (Macintosh; U; Intel Mac OS X 10.6; en-US;...

Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8

Accept-Language: en-us,en;q=0.5

Accept-Encoding: gzip,deflate

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Connection: keep-alive

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Content-Type: text/html; charset=UTF-8

Content-Encoding: gzip

Server: gws

Content-Length: 3533

X-XSS-Protection: 0

Other path examples

/page.html

?q=cat%20pictures&btn=...

/images/title.png

/2009/10/19/naval-gazing

Status code

```
GET / HTTP/1.1
Host: www.google.com
User-Agent: Mozilla/5.0 (Macintosh; U; Intel Mac OS X 10.6; en-US;...
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: en-us,en;q=0.5
Accept-Encoding: gzip,deflate
Accept-Charset: ISO-8859-1,utf-8;q=0.7,*;q=0.7
Keep-Alive: 300
Connection: keep-alive
Cookie: PREF=ID=1b1e370406541f31:U=cbfc7563400e91be:LD=en:NR=10:TM=12546...
```

▼
HTTP/1.x **200** OK
Date: Sun, 18 Oct 2009 23:43:31 GMT
Expires: -1
Cache-Control: private, max-age=0
Content-Type: text/html; charset=UTF-8
Content-Encoding: gzip
Server: gws
Content-Length: 3533
X-XSS-Protection: 0

Common status codes

200 OK
302 Found
304 Not modified
404 Not found
500 Server error

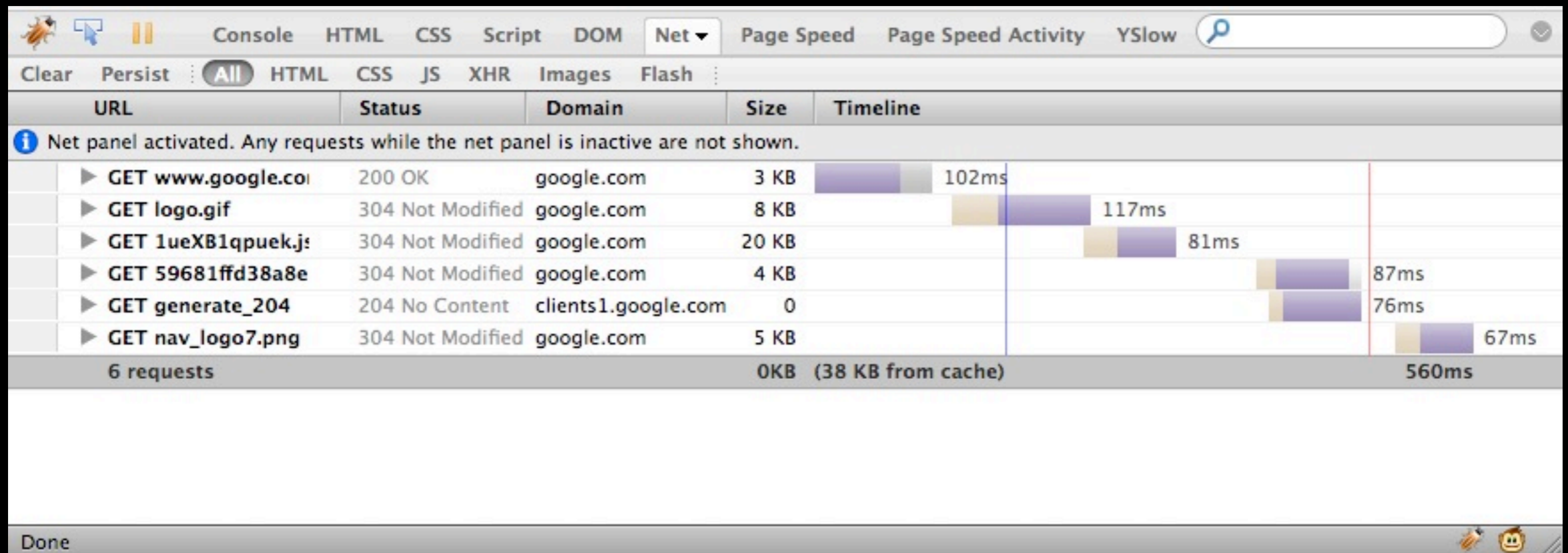
Party trick

```
telnet www.google.com 80↵
Trying 64.233.169.147...
Connected to www.l.google.com.
Escape character is '^]'.
GET / HTTP/1.1↵
↵
HTTP/1.1 200 OK
Date: Mon, 19 Oct 2009 00:14:36 GMT
Expires: -1
Cache-Control: private, max-age=0
Content-Type: text/html; charset=ISO-8859-1...
^]
quit↵
```

Type this at the Terminal

↵ = enter key
^] = ctrl-]

Repeat for each file



The same HTTP request, response process is repeated for each of the six files that compose this Google page view

Sending data

The image shows a screenshot of a web form titled "Contact Form" from Wufoo. The form has a white background with an orange header bar containing the "Wufoo" logo. Below the header, the title "Contact Form" is displayed. The form contains three main input fields: a large text area for a message, a single-line text input for an email address, and a "Submit" button. The "Message" field is highlighted with a yellow border and contains the text "Yo, what's up!". To the right of this field, a grey error message box says "This field is required." Below the message field is the "Email Address" field, which is currently empty. The "Submit" button is located at the bottom left of the form.

Web forms **send data** back to the web server

GET vs POST

- GET requests pass data using a part of the request URL called a query string
 - ▶ `http://www.youtube.com/results?search_query=au...`
- POST requests pass data immediately following request headers
- You can't link to a POST

GET requests

The image shows a browser window displaying a YouTube search results page. The address bar contains the URL: `http://www.youtube.com/results?search_query=autotune+the+news&search_type=&aq=f`. A callout box with a black background and yellow text states: "Data is sent from the browser to the server using the **query string**". The page content includes the YouTube logo, search filters (All, Channels, Playlists), and search options (Sort by: Relevance, Uploaded: Anytime). The search results for "autotune the news" are shown, including a channel result for "singing. dancing. time travel." and a video result titled "Auto-Tune the News #9: Nobel. health care. United Nations ...".

YouTube - autotune the news

http://www.youtube.com/results?search_query=autotune+the+news&search_type=&aq=f

YouTube - autotune the news

You Tube
Broadcast Yourself™ Home Videos

autotune the news


Data is sent from the browser to the server using the **query string**

"autotune the news" results 1 - 20 of about 721


All Channels Playlists Sort by: Relevance ▼ Uploaded: Anytime ▼ Type: A

Also try: auto tune barely political gregory brothers

Channel Results for autotune the news

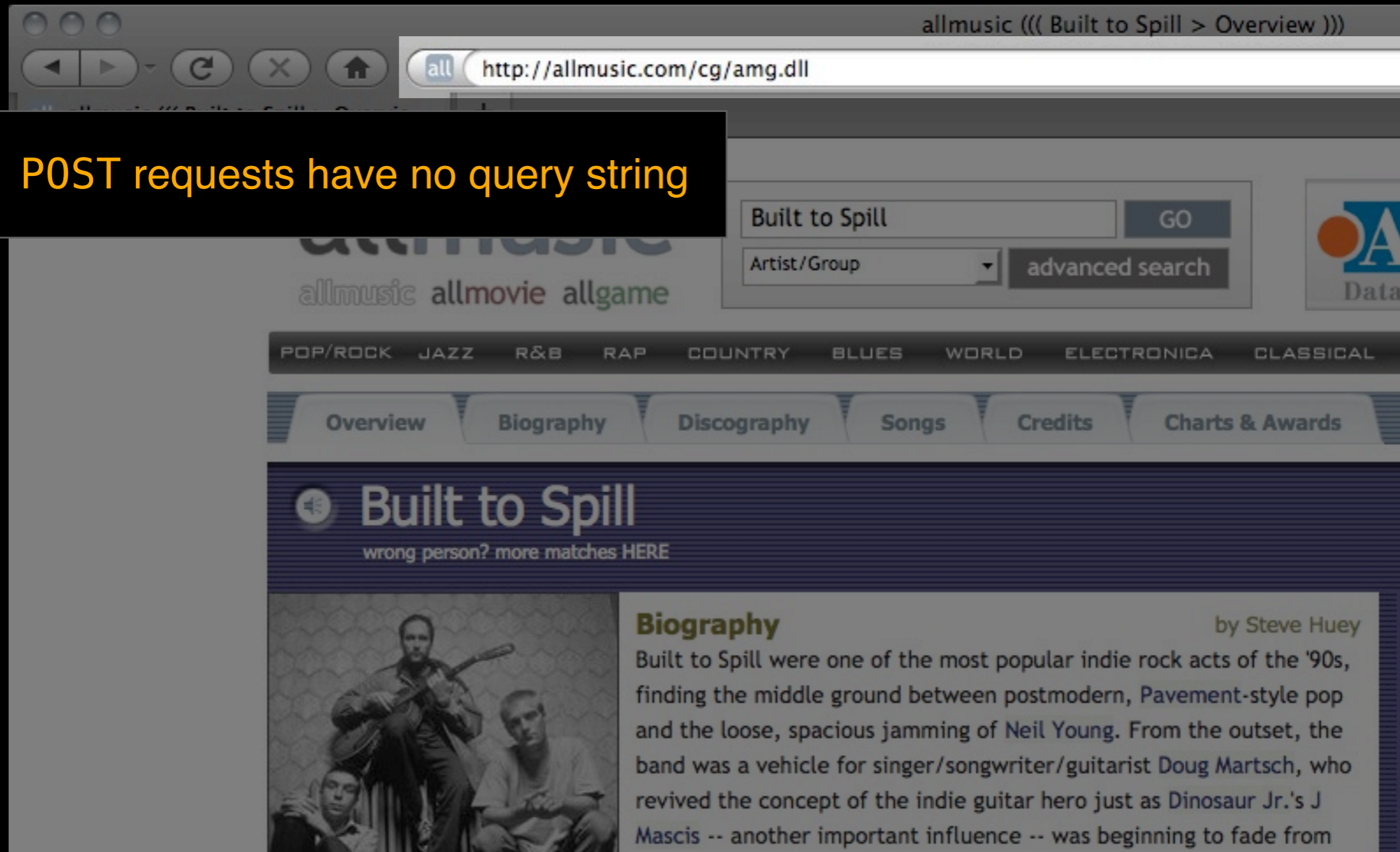
 **singing. dancing. time travel.**
spreading opera throughout space and time
Recent Video: Secretary Chung and President Obama Auto-Tune Health Care
Channel 28 Videos 48,603 Subscribers schmoyoho

Recent Videos for autotune the news

 **Auto-Tune the News #9: Nobel. health care. United Nations ...**
presidents and prime ministers sing in harmony. Love and happiness abounds. Get the mp3: amiestreet.com Donations: www.thegregorybrothers.com ...
★★★★★ 3 days ago 200,927 views schmoyoho

POST requests

POST requests have no query string



The screenshot shows a web browser window with the URL `http://allmusic.com/cg/amg.dll`. The page displays the AllMusic search interface for the band "Built to Spill". A search bar contains the text "Built to Spill" and a "GO" button. Below the search bar, there are navigation tabs for "Overview", "Biography", "Discography", "Songs", "Credits", and "Charts & Awards". The "Biography" tab is selected, showing a bio for the band. The bio text reads: "Built to Spill were one of the most popular indie rock acts of the '90s, finding the middle ground between postmodern, Pavement-style pop and the loose, spacious jamming of Neil Young. From the outset, the band was a vehicle for singer/songwriter/guitarist Doug Martsch, who revived the concept of the indie guitar hero just as Dinosaur Jr.'s J Mascis -- another important influence -- was beginning to fade from".

POST requests

```
POST /cg/amg.dll HTTP/1.1
Host: allmusic.com
User-Agent: Mozilla/5.0 (Macintosh; U; Intel Mac OS X 10.6; en-US; ...)
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: en-us,en;q=0.5
Accept-Encoding: gzip,deflate
Accept-Charset: ISO-8859-1,utf-8;q=0.7,*;q=0.7
Keep-Alive: 300
Connection: keep-alive
Referer: http://allmusic.com/
Cookie: SimDB=1; __utma=215752519.85568599.1255921272.1255921272.12559...
Content-Type: application/x-www-form-urlencoded
Content-Length: 51
P=amg&sql=Built+to+Spill&x=27&y=11&opt1=1&samples=1
```

The syntax is the same as with query strings* but without the ? symbol in front

* This is not always true e.g., file uploads

Requesting a page

The screenshot shows a web browser window with the title "YouTube - autotune the news". The address bar contains the URL: http://www.youtube.com/results?search_query=autotune+the+news&search_type=&aq=f. The YouTube logo and "Broadcast Yourself™" tagline are visible. A search bar contains the text "autotune the news" and a "Search" button. Below the search bar, navigation links for "Home", "Videos", "Channels", and "Shows" are present. The search results are displayed as "“autotune the news” results 1 - 20 of about 721". Filter options include "All", "Channels", and "Playlists". Sorting options are "Sort by: Relevance" and "Uploaded: Anytime". Suggested search terms are "auto tune", "barely political", and "gregory brothers". The "Channel Results for autotune the news" section features a channel named "singing. dancing. time travel." with a video thumbnail showing three people. The channel has 28 videos and 48,603 subscribers. A recent video is titled "Secretary Chung and President Obama Auto-Tune Health Care". The "Recent Videos for autotune the news" section shows a video titled "Auto-Tune the News #9: Nobel. health care. United Nations ..." with a thumbnail showing three people. The video has 5 stars, was uploaded 3 days ago, and has 200,927 views.

YouTube - autotune the news

http://www.youtube.com/results?search_query=autotune+the+news&search_type=&aq=f

YouTube - autotune the news

You Tube Broadcast Yourself™ [Home](#) [Videos](#) [Channels](#) [Shows](#)


Search

“autotune the news” results 1 - 20 of about 721

All [Channels](#) [Playlists](#) Sort by: Relevance ▾ Uploaded: Anytime ▾ Type: A

Also try: [auto tune](#) [barely political](#) [gregory brothers](#)

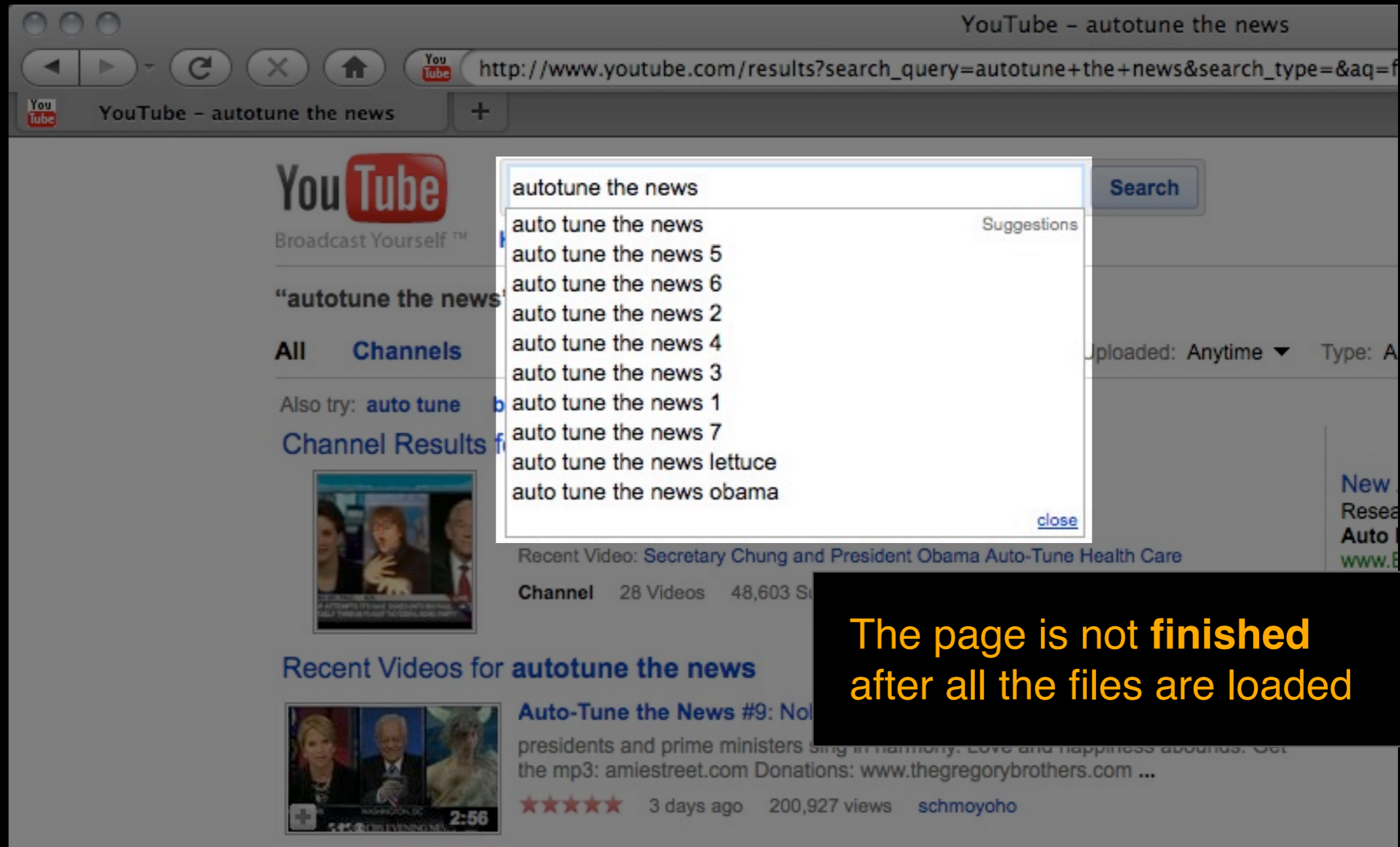
Channel Results for autotune the news

 **singing. dancing. time travel.**
spreading opera throughout space and time
Recent Video: [Secretary Chung and President Obama Auto-Tune Health Care](#)
Channel 28 Videos 48,603 Subscribers [schmoyoho](#)

Recent Videos for autotune the news

 **Auto-Tune the News #9: Nobel. health care. United Nations ...**
presidents and prime ministers sing in harmony. Love and happiness abounds. Get the mp3: [amiestreet.com](#) Donations: [www.thegregorybrothers.com](#) ...
★★★★★ 3 days ago 200,927 views [schmoyoho](#)

Requesting *more*



The image shows a screenshot of a web browser displaying a YouTube search results page. The search query is "autotune the news". A dropdown menu is open, showing suggestions for the search query. The suggestions are:

- autotune the news
- auto tune the news
- auto tune the news 5
- auto tune the news 6
- auto tune the news 2
- auto tune the news 4
- auto tune the news 3
- auto tune the news 1
- auto tune the news 7
- auto tune the news lettuce
- auto tune the news obama

The page also shows the YouTube logo, the search bar, and a "Search" button. Below the suggestions, there is a "Recent Video" section with a video thumbnail and a "Channel" section with a channel name and video count. A text box is overlaid on the page, containing the text:

The page is not **finished** after all the files are loaded

How does the browser request more data?

- AJAX: HTTP requests in JavaScript
- The XMLHttpRequest object in JavaScript lets us make new requests
- Web frameworks offer simpler interfaces:
 - ▶ \$.get() and \$.post in **jQuery**
 - ▶ Request object in **MooTools**

How does the *web server* request more data?

- Short answer: **it doesn't**
- Longer answer: HTTP is designed so the **client** initiates all requests
- New tricks which we won't cover
 - Comet e.g., long polling
 - Web hooks callbacks between web services

Next week

```
<?php  
echo "Hello, world!";  
?>
```