Ajax

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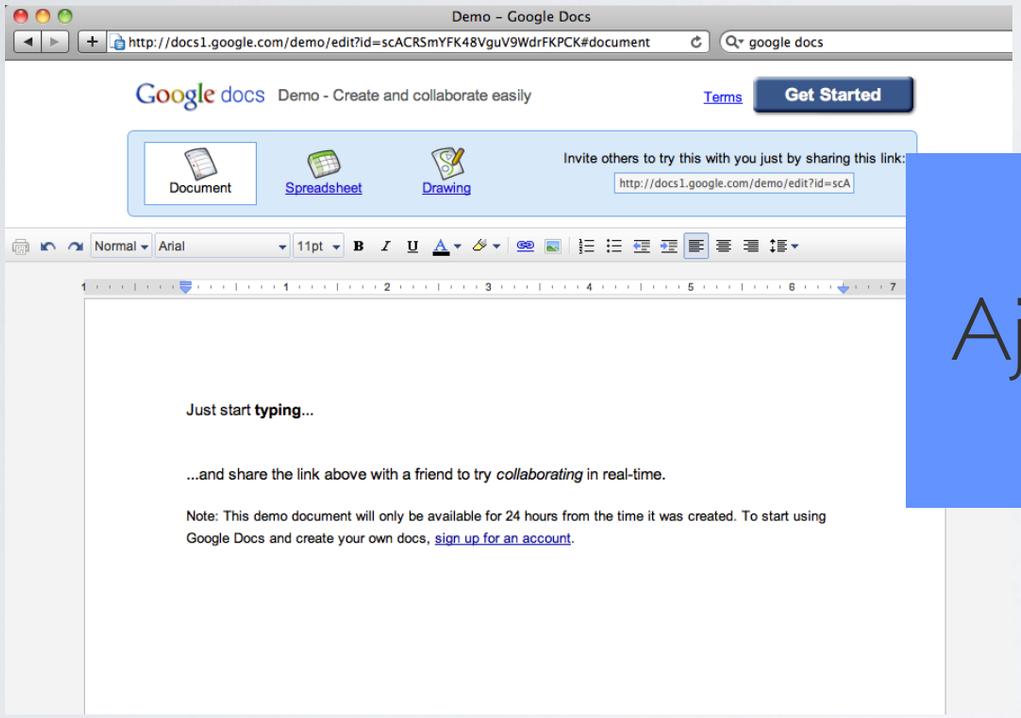
Ajax - fetching data without refreshing the page



Ajax

id=scACRSm...

anything

Google

Javascript

Why do we need Ajax?

So far, when we wanted to

- send data to the server
- or retrieve data from the server

◉ we had to refresh the entire page
(i.e reloading HTML, CSS, JS and all media files)

✓ But, why not using Javascript to process the data
and perform the necessary page changes?

Ajax - Asynchronous Javascript And XML

Fetch/push content from/to the server asynchronously
i.e without having to refresh the page

- ◉ Ajax is not a language
- ✓ It is a simple **Javascript command**

History of Ajax

- Patent from Microsoft (filled in 2000, granted in 2006)
  - XMLHTTP ActiveX control (Internet Explorer 5)
- Adopted and adapted by Opera, Mozilla and Apple
  - XMLHttpRequest Javascript object (standard)
- Before / After IE7
  - ◉ Different code for different browser (emergence of the javascript framework *Prototype*)
  - ✓ Javascript Object was adopted by IE7

Ajax revolutionized the Web

- ✓ Started with Gmail and Google Maps
- Advantages
  - Low latency
  - Rich interactions
- Consequences
  - Webapp center of gravity moved to the client side
  - Javascript engine performance race

Standard Ajax

```
var xhr = new XMLHttpRequest();
xhr.onload = function(){
  if (xhr.status !== 200)
      console.error("[" + xhr.status + "]" + xhr.responseText);
  else
      console.log(xhr.responseText);
};
xhr.setRequestHeader(key, value);
xhr.open(method, url, true);
xhr.send(body);
```

(always) asynchronous

Concurrency issue in Ajax - a typical example

main thread

```
var result = ""
```

initialization

child thread

```
var xhr = new XMLHttpRequest();
xhr.onload = function (){
        result = xhr.responseText;
}
xhr.open(method, url, true );
```

assignment

```
xhr.send(body);
document.getElementById.innerHTML = result;
```

access

`result` will either be `""` or `"Hello world"`
depending on the execution (non determinism)

➡ **Race Condition!**