The HTTP protocol

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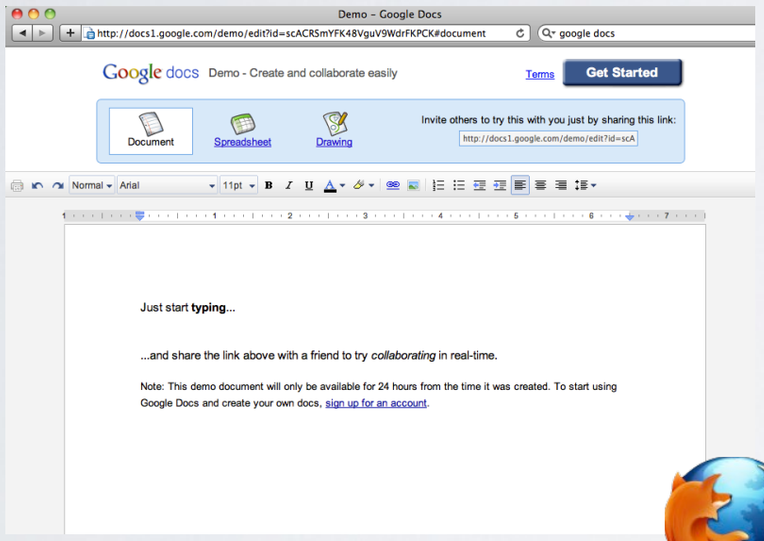
Anatomy of a Web Application

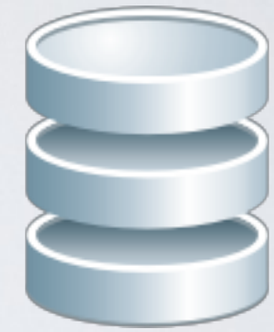
Client Side



Web Browser

Server Side

Web Server



Database

The HTTP protocol

Network protocol for requesting/receiving data on the Web

- Standard TCP protocol on **port 80** (by default)
- **URI/URL** specifies what resource is being accessed
- The **request method** specified with a command

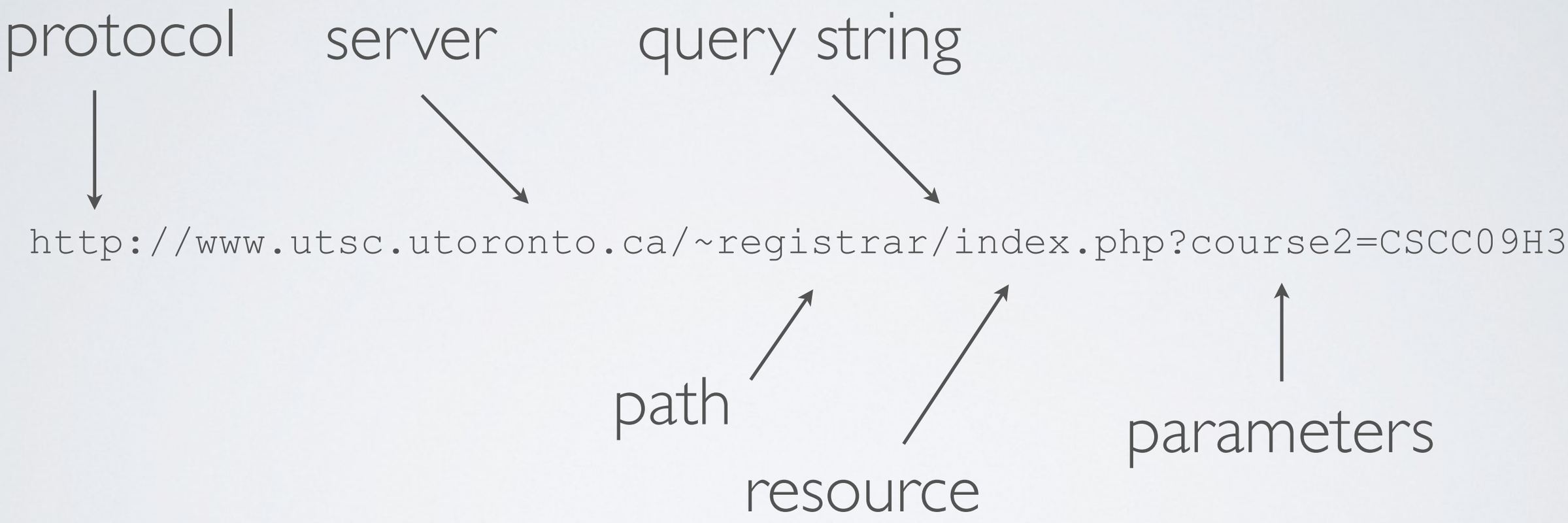
Let's look at what a web server does

telnet to a web server

```
> telnet www.utsc.utoronto.ca 80
GET /
```

enter HTTP requests

Anatomy of a URL



HTTP Request Methods

- **`POST`** - add an unidentified resource
- **`PUT`** - add a an identified resource
- **`GET`** - get a resource
- **`PATCH`** - update a resource
- **`DELETE`** - delete a resource
- and others `HEAD`, `TRACE`, `CONNECT`, `OPTIONS`

HTTP Request

- **Method** - `POST`, `PUT`, `GET`, `PATCH`, `DELETE` ...
- **Url** - protocol + server + query string
- **Headers** - key/value pairs
- [optional] **Body** - data

Using the command **curl**

```
$ curl options url
```

-v verbose

--request *request_method*

--data *request_body*

--header *header*

HTTP response

- **Status code**
- **Headers** - key/value pairs
- [optional] **Body** - data

HTTP response status codes

- `1xx` - information
- `2xx` - success
- `3xx` - redirection
- `4xx` - client error
- `5xx` - server errors

Method properties

An HTTP request/response

- may have a request body
- may have a response body
- may not have side effects a.k.a safe
- may have the same result when called multiple times a.k.a idempotent

➡ the choice is left to the programmer

What the standard recommends

Method	Request Body	Response Body	Safe	Idempotent
POST	✓	✓	✗	✗
PUT	✓	✓	✗	✓
GET	✗	✓	✓	✓
PATCH	✓	✓	✗	✗
DELETE	✗	✓	✗	✓