



COOKIES



How can apps maintain user state?



Cookies!

small bits of data downloaded to your computer so that a site can “remember” you and what you did on subsequent visits



HOW THEY WORK

uniquely assigned to you and your computer

can be read only by a Web server in the domain
that issued the cookie to you

new browser, different computer, delete cookies?

1st time user

ARE THEY SAFE?

cookies are bits of text not software

cannot read information, run programs, or install software

but what if I don't like cookies...



Most browsers are set to accept cookies automatically

Modify browser settings to block cookies or ask for approval

Blocking cookies can interfere with site usability

Uses

SESSION MANAGEMENT



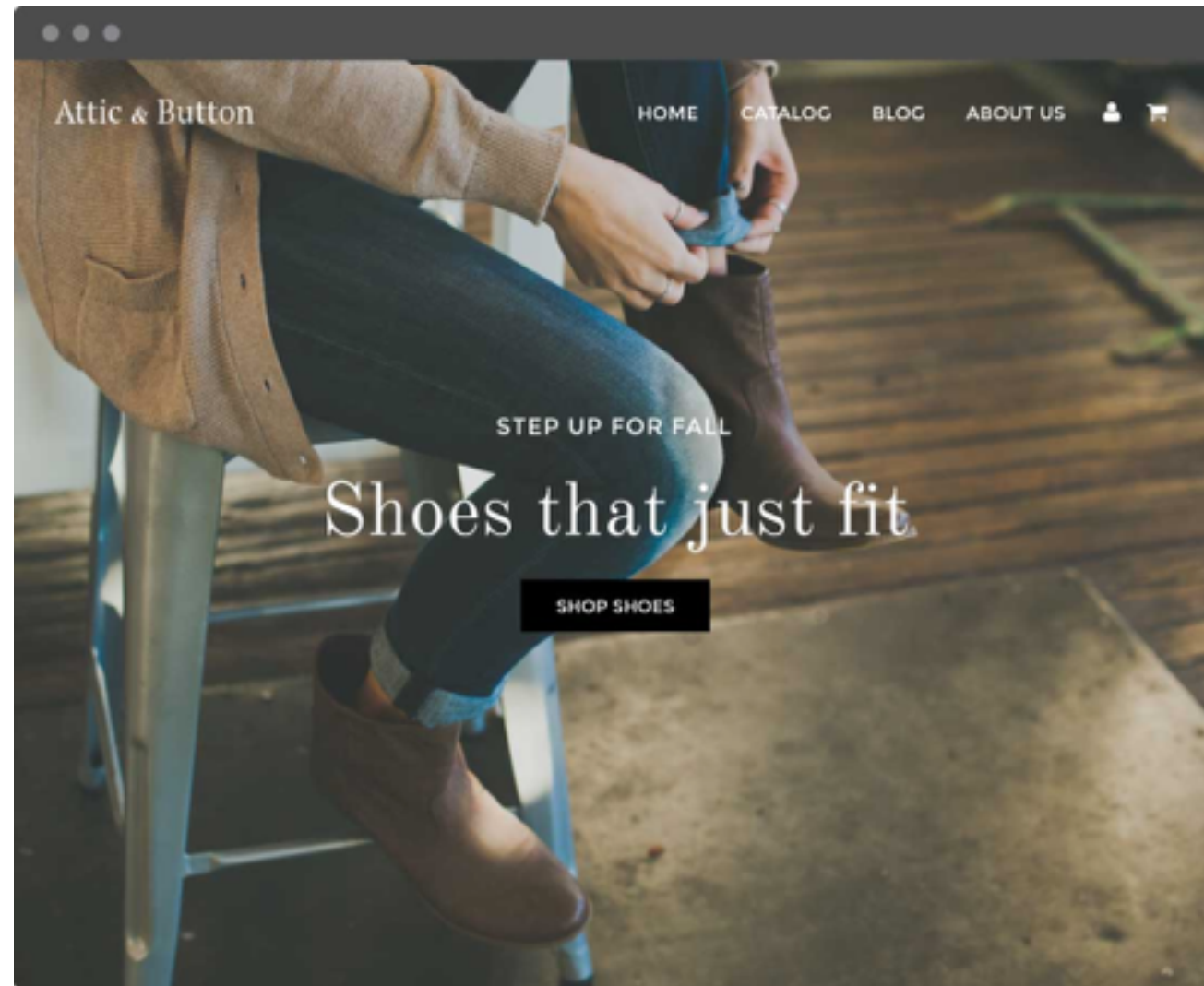
Remember a user as they navigate through site

Unique session identifier sent to the server

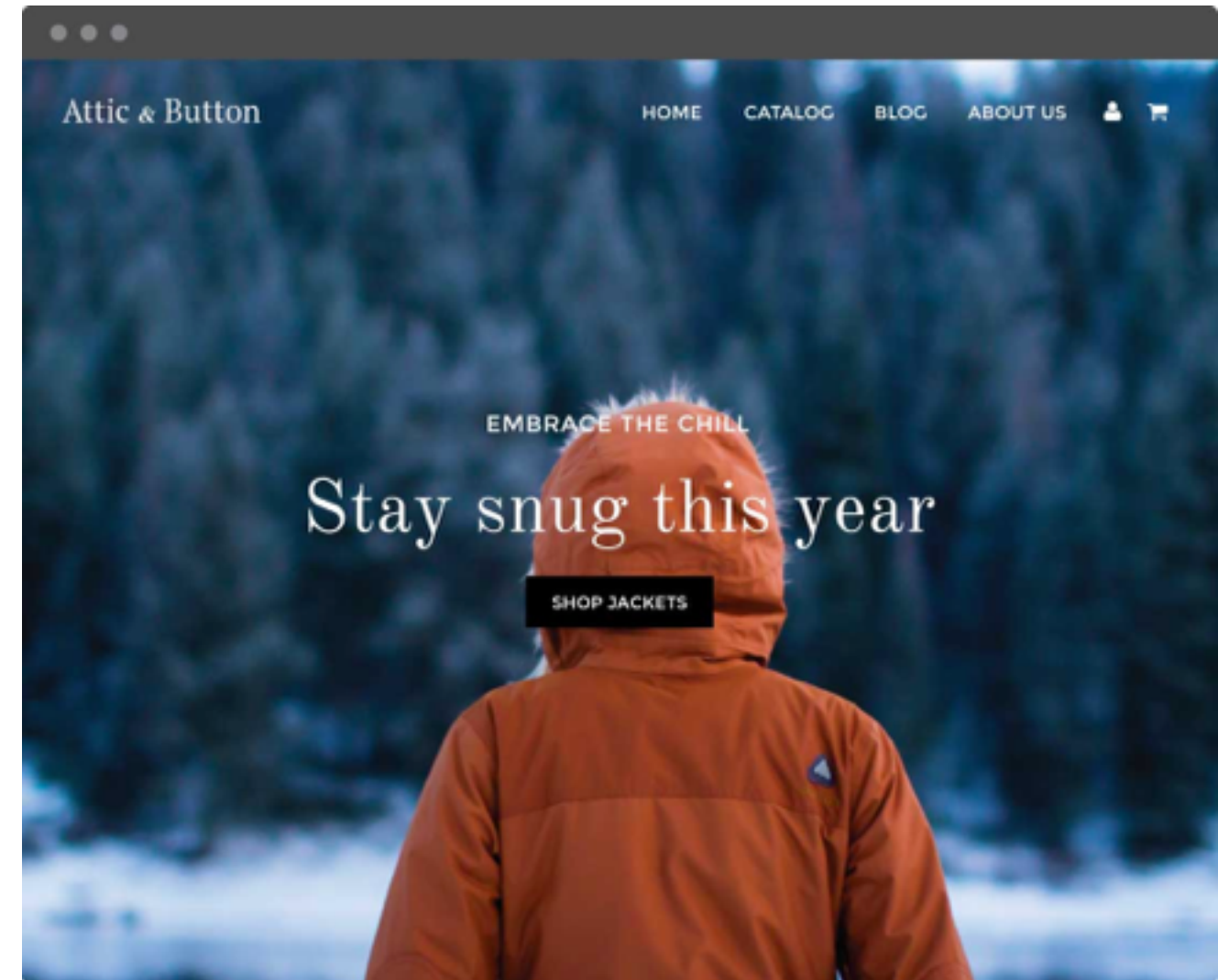
Site database stores user's personal information

Used to remember an authenticated user

PERSONALIZATION



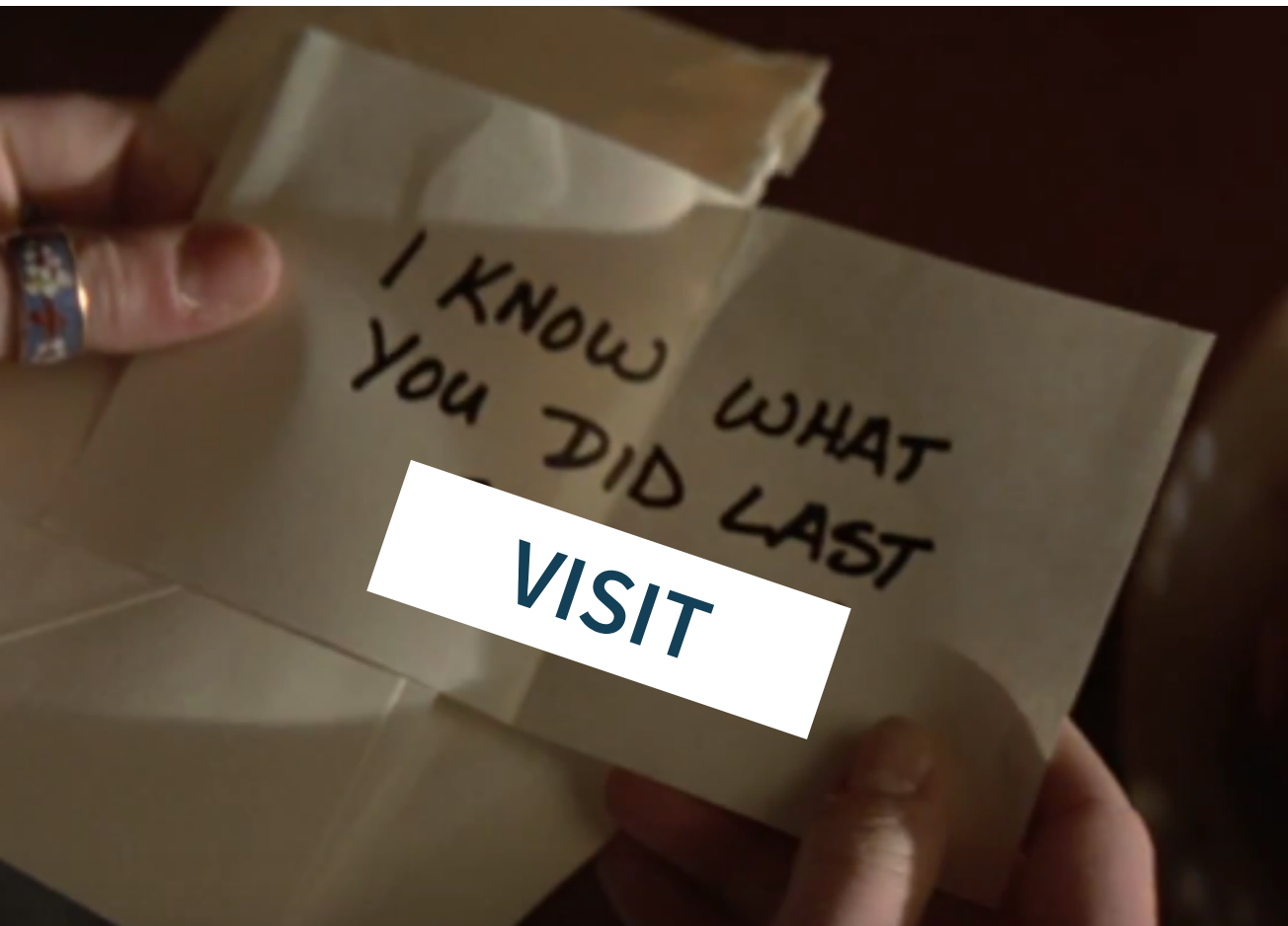
experience for visitors who
previously browsed shoes



experience for visitors in
cold weather locations

<https://www.optimizely.com/products/personalization/>

TRACKING



Track user behavior on site

what they do, how often they
come back, etc.

build up server logs for each user

Types

SESSION COOKIES

exists only in temporary memory while the user navigates the website

deleted when user closes the browser (no expiration date)

PERSISTENT COOKIES

transmitted to the server every time the user visits the website that it belongs to

or every time the user views a resource belonging to that website from another website (tracking)

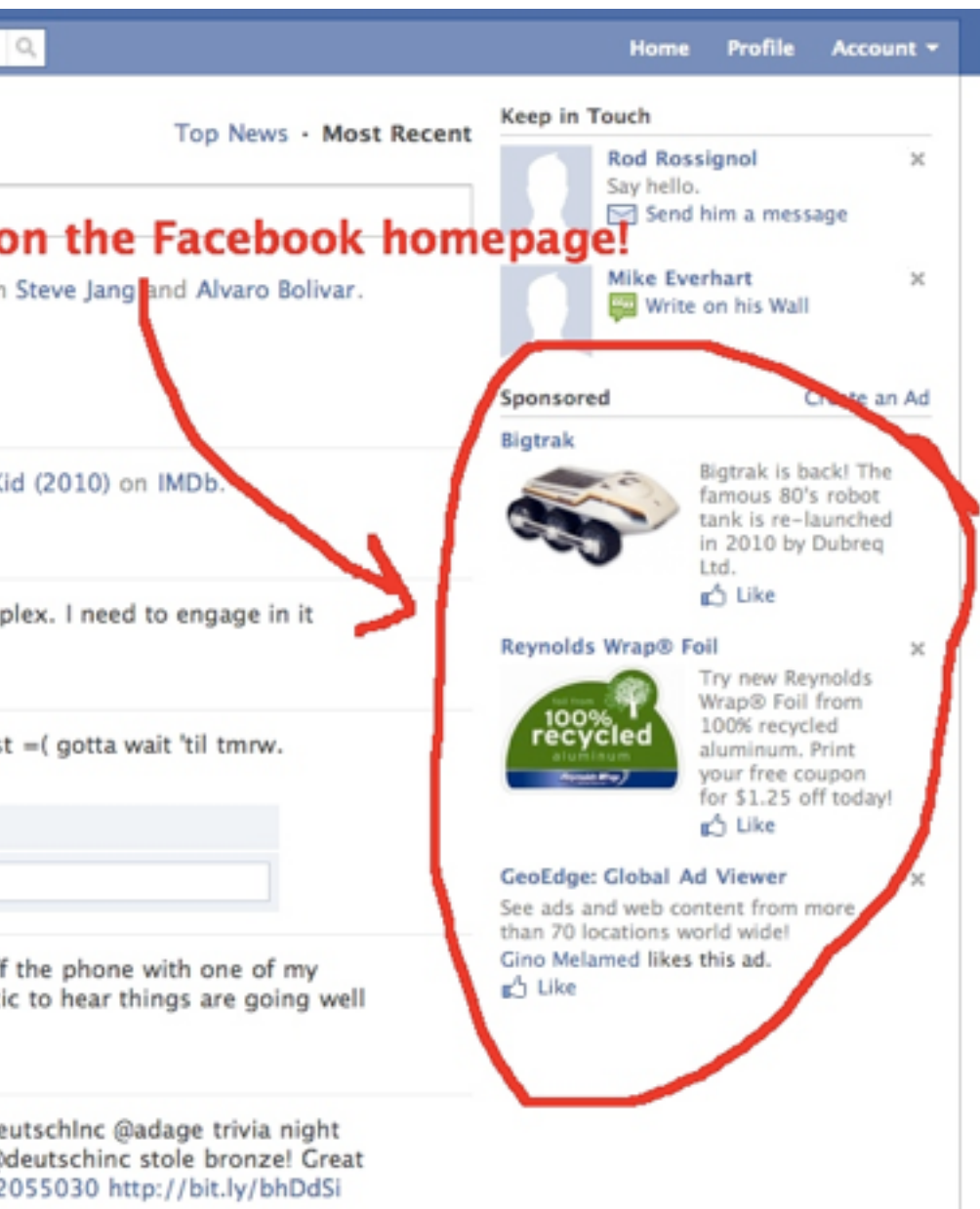
expires at a specific date or after a specific length of time

THIRD-PARTY COOKIES

Set when retrieving components on a web page that are stored on servers in *other domains*

Allows advertising companies to track users across multiple sites

WEB BEACONS



web bug, tracking bug, page tag, tag

implemented through embedded image:

tracking pixel, pixel tag, 1x1 gif, clear gif

phones home (usually used with cookies)

Implementation

Client's First Request to a Site

```
GET /index.html HTTP/1.1
```

```
Host: www.example.org
```

```
...
```

https://en.wikipedia.org/wiki/HTTP_cookie

Server Response

HTTP/1.0 200 OK

Content-type: text/html

Set-Cookie: theme=light

Session Cookie



Set-Cookie: sessionToken=abc123;

Expires=Wed, 09 Jun 2021 10:18:14 GMT

...

Persistent Cookie



https://en.wikipedia.org/wiki/HTTP_cookie

Client Request to Another Page On Site

GET /spec.html HTTP/1.1

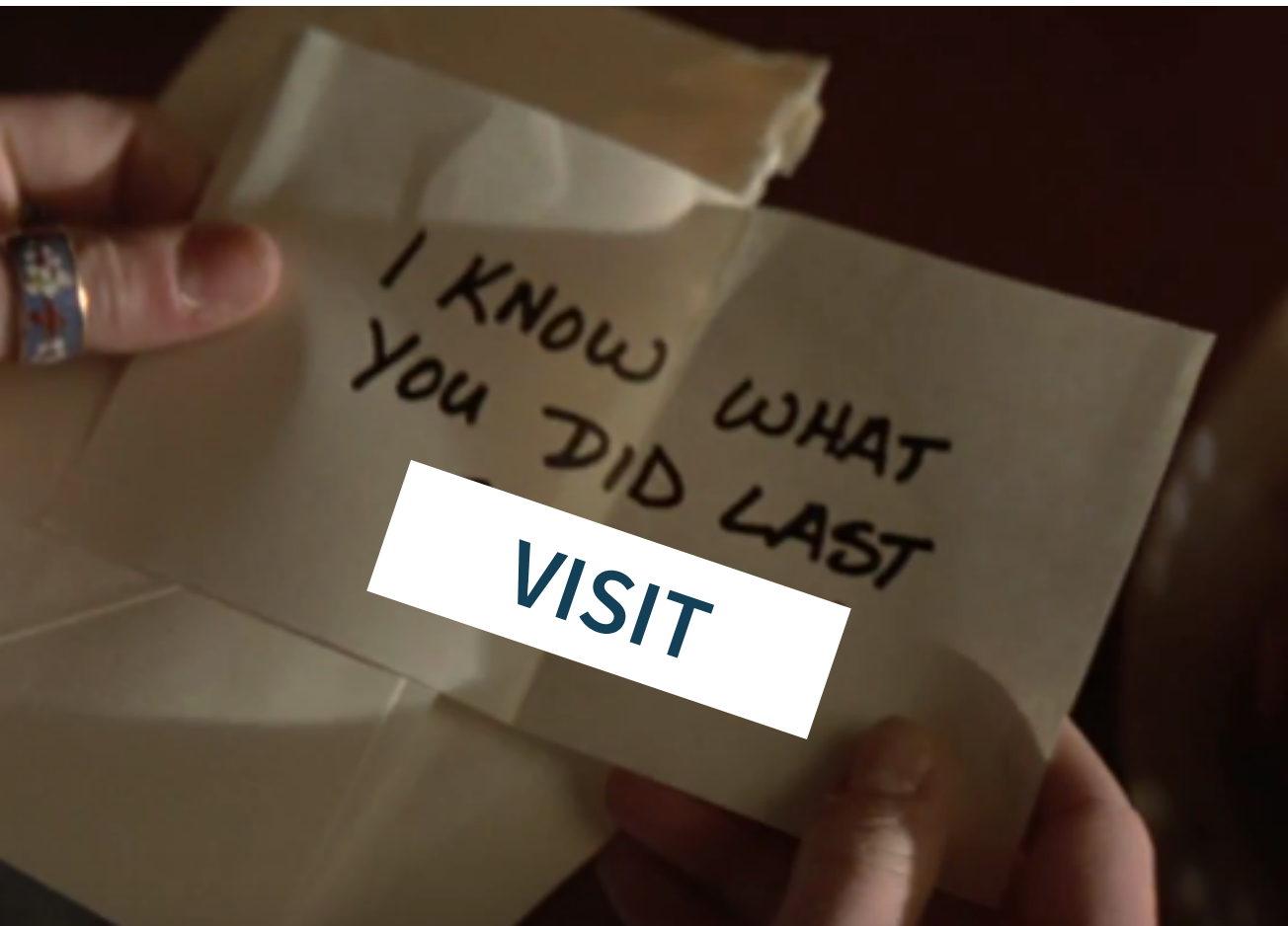
Host: www.example.org

Cookie: theme=light; sessionId=abc123

...

how do you feel about cookies?

CLIFFHANGER



Security concerns...

NEXT CLASS: PASSPORT LAB

courses.engr.illinois.edu/cs498rk1/