

Safe browsing - is an ad-blocker extension enough?

What we would like to avoid...

While browsing the Web?

1. Getting infected by malicious advertisement / content
2. Being tracked by marketing services and social networks
3. Getting annoyed by abusive advertisement

How Ad-Blockers work?

Their purpose is to achieve:

▶ Element Hiding

- Objects used to serve ads are being blocked automatically
- Space on the page taken by ads will now be used for displaying the actual page contents

▶ Request Blocking

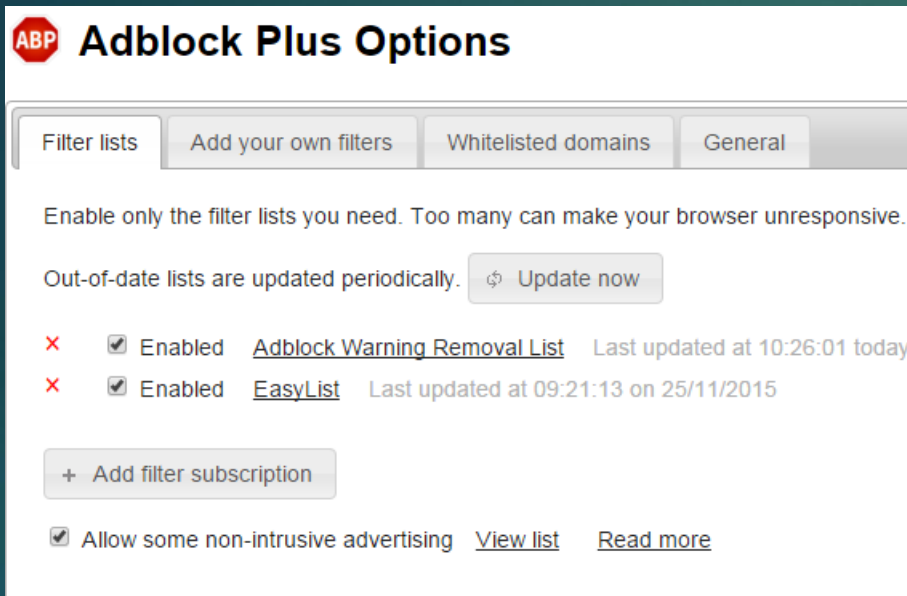
- HTTP requests for retrieving resources that are supposed to be blocked will be prevented from loading
- Works through regex expressions / rules that are transformed to regular expressions

Benchmarking Blockers!

| | Ad Blockers | | | | Tracking Blockers | |
|-----------------|--------------|---------|---------|-----------------|--------------------------------|--------------------------------|
| | Adblock Plus | Adblock | Adguard | Ublock Origin | Disconnect | Ghostery |
| Open Source | ✓ | ✗ | ✗ | ✓ | ✓ | ✗ |
| Regex Filters | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Host Filters | ✗ | ✗ | ✗ | ✓ | ✗ | ✗ |
| Import Lists | ✓ | ✓ | ✓ | ✓ | ✗ | ✗ |
| Hide Element | ✓ | ✓ | ✓ | ✓ | ✗ | ✗ |
| Whitelist Ads | ✓ | ✓ | ✓ | ✓ | ✗ | ✓ |
| Send Statistics | ✗ | ✗ | ✓ | ✗ | ✗ | ✓ |
| Browser | All | Chrome | All | Chrome, Firefox | Chrome, Firefox, Opera, Safari | Chrome, Firefox, Opera, Safari |

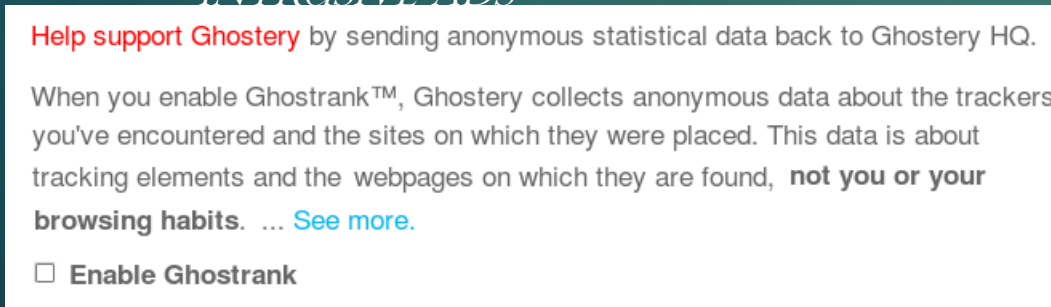
All: Internet Explorer, Edge, Chrome, Firefox, Opera, Safari

More on Privacy...and Statistics!



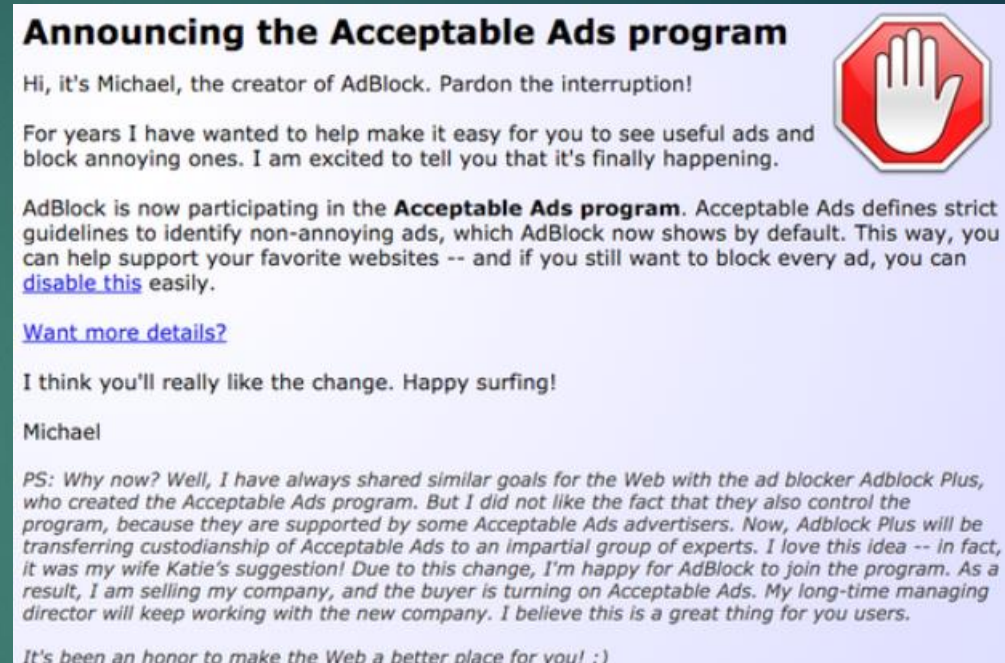
The screenshot shows the 'Adblock Plus Options' interface. It has tabs for 'Filter lists', 'Add your own filters', 'Whitelisted domains', and 'General'. Under 'Filter lists', there is a note: 'Enable only the filter lists you need. Too many can make your browser unresponsive. Out-of-date lists are updated periodically. [Update now]'. Two filter lists are shown: 'Adblock Warning Removal List' (last updated at 10:26:01 today) and 'EasyList' (last updated at 09:21:13 on 25/11/2015). There is a '+ Add filter subscription' button and a checkbox for 'Allow some non-intrusive advertising' with links to 'View list' and 'Read more'.

ADBLOCK PLUS NON-INTRUSIVE ADS



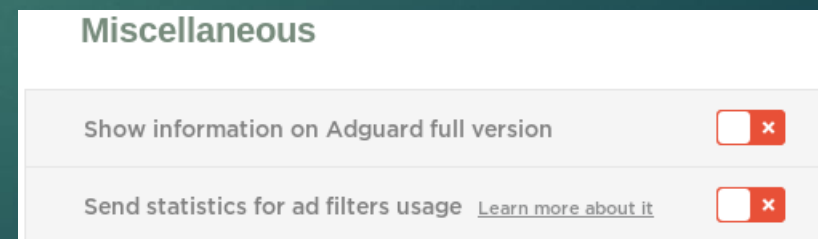
The screenshot shows a notification from Ghostery: 'Help support Ghostery by sending anonymous statistical data back to Ghostery HQ. When you enable Ghostrank™, Ghostery collects anonymous data about the trackers you've encountered and the sites on which they were placed. This data is about tracking elements and the webpages on which they are found, not you or your browsing habits. ... See more.' At the bottom, there is a checkbox labeled 'Enable Ghostrank'.

GHOSTERY STATISTICS PROGRAM



The screenshot shows a text announcement from Michael, the creator of Adblock. It includes a red octagonal stop sign icon with a white hand. The text reads: 'Announcing the Acceptable Ads program. Hi, it's Michael, the creator of Adblock. Pardon the interruption! For years I have wanted to help make it easy for you to see useful ads and block annoying ones. I am excited to tell you that it's finally happening. Adblock is now participating in the Acceptable Ads program. Acceptable Ads defines strict guidelines to identify non-annoying ads, which Adblock now shows by default. This way, you can help support your favorite websites -- and if you still want to block every ad, you can disable this easily. Want more details? I think you'll really like the change. Happy surfing! Michael PS: Why now? Well, I have always shared similar goals for the Web with the ad blocker Adblock Plus, who created the Acceptable Ads program. But I did not like the fact that they also control the program, because they are supported by some Acceptable Ads advertisers. Now, Adblock Plus will be transferring custodianship of Acceptable Ads to an impartial group of experts. I love this idea -- in fact, it was my wife Katie's suggestion! Due to this change, I'm happy for Adblock to join the program. As a result, I am selling my company, and the buyer is turning on Acceptable Ads. My long-time managing director will keep working with the new company. I believe this is a great thing for you users. It's been an honor to make the Web a better place for you! :)

ADBLOCK ACCEPTABLE ADS



The screenshot shows the 'Miscellaneous' settings section of AdGuard. It contains two toggle switches: 'Show information on Adguard full version' and 'Send statistics for ad filters usage'. Both are currently turned off, indicated by a red 'x' in a square box. A link 'Learn more about it' is next to the second toggle.

ADGUARD SEND STATISTICS

Tracking with Cookies

1. Your browser gets tagged from the site that you just visited by receiving a cookie
2. You continue browsing a different site which has an area for suggested advertisements (targeted ads)
3. The web page you are currently browsing reads the cookie
4. And... You get a relevant advertisement!
5. The advertisement may be of relevant content OR you may get an advertisement from the site you were browsing just before

Malvertisements

Malware distributed via advertisements. The majority gets performed through iframes

▶ Visible iframes

- Usually a frame with an advertisement that leads to a 3rd party which is being compromised OR
- Usually a frame from an advertising company which can execute malicious Javascript

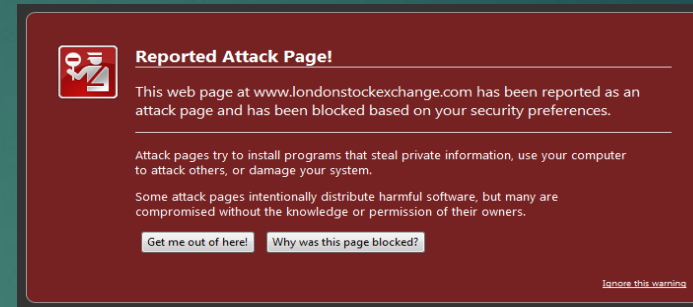
▶ Invisible iframes

- Html code that has width and height set to 0 and gets executed automatically

Malvertising Incidents



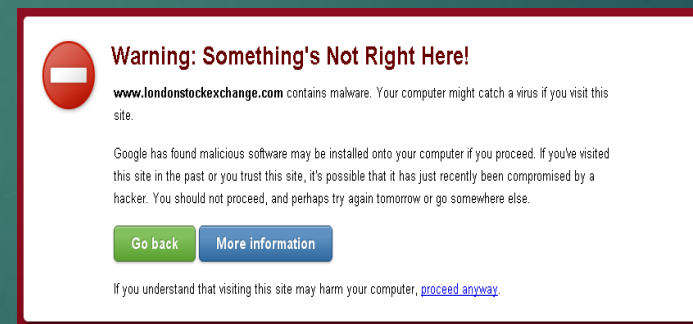
NYTIMES



*LONDON STACK
EXCHANGE*



SPOTIFY



*LONDON STACK
EXCHANGE CHROME*

Fingerprinting through Javascript

```
d = {
  userAgent: "User-Agent",
  appVersion: "App Version",
  appName: "App Name",
  appCodeName: "App Code Name",
  appMinorVersion: "App Minor Version",
  product: "Product",
  productSub: "Product Sub",
  vendor: "Vendor",
  vendorSub: "Vendor Sub",
  buildID: "Build ID",
  platform: "Platform",
  cpuClass: "CPU Class",
  oscpu: "OS CPU",
  hardwareConcurrency: "Hardware Concurrency",
  maxTouchPoints: "Max Touch Points",
  language: "Language",
  languages: "languages",
  browserLanguage: "Browser Language",
  userLanguage: "User Language",
  systemLanguage: "System Language",
  onLine: "OnLine",
  doNotTrack: '<a href="/donottrack">Do Not Track</a>',
  msDoNotTrack: '<a href="/donottrack">Do Not Track</a>',
  cookieEnabled: "Cookies Enabled"
};
```

Benchmarking Request Blockers!

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| | Noscript | Request Policy | Umatrix | Policeman | Ublock Origin |
|----------------------------|----------|----------------|---------|-----------|---------------|
| Open Source | ✓ | ✓ | ✓ | ✓ | ✓ |
| Domain Blocking | ✓ | ✓ | ✓ | ✓ | ✓ |
| Script Blocking | ✓ | ✗ | ✓ | ✓ | ✓ |
| Plugin Blocking | ✓ | ✗ | ✓ | ✓ | ✗ |
| Frame Blocking | ✓ | ✗ | ✓ | ✓ | ✓ |
| Image Blocking | ✗ | ✗ | ✓ | ✓ | ✓ |
| Styles Blocking | ✗ | ✗ | ✓ | ✓ | ✗ |
| Host Filters | ✗ | ✗ | ✓ | ✓ | ✓ |
| Cross Site Request Forgery | ✗ | ✓ | ✗ | ✗ | ✗ |
| XSS/ABE | ✓ | ✗ | ✗ | ✗ | ✗ |

Questions?

Thank you!