



Kepler – Raising Browser Security Awareness

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OUSPG – Oulu University Secure
Programming Group





OUSPG – Oulu University Secure Programming Group

- Founded 1996
- Purpose is to study, evaluate and develop methods to prevent, discover and eliminate implementation level security vulnerabilities



Browser security awareness

- 50% to 67% of people recognize secure browsing (depending on the person's technical background)
- Security important to avoid man-in-the-middle attacks and eavesdropping (online banking, web purchases, social media)
- Login data sent unencrypted is always a risk (Facebook before 2011!)
- Public WLANs a big issue
- HTTPS causes more traffic though





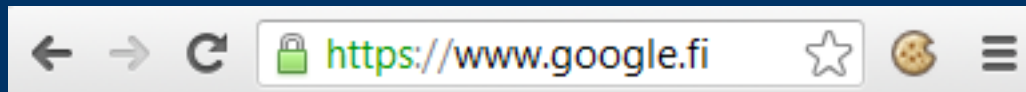
Goals

- Improve the awareness of web security to help users make informed decisions about what sites to trust



Motivation

- Wanted geographical information about where data is sent during every day browsing
- Wanted to know what companies get contacted
- Wanted to increase awareness in a clear way and needed more information from web requests



Why Chrome extension?

- Distribution channel available to millions (Chrome web store)
- No need for third-party services or extensive installation of software
- No logging and no sending of information



Related solutions

- Collusion

Collusion for Chrome

Unblock known tracking sites

[engadget.com](#)

When you visit this site, the following sites are informed:

- [google-analytics.com](#)
- [google.com](#)
- [scorecardresearch.com](#)
- [blogsmithmedia.com](#)
- [aolcdn.com](#)
- [moatads.com](#)
- [fvre.co](#)
- [blogcdn.com](#)
- [aol.com](#)
- [adsonar.com](#)
- [lexis.com](#)
- [advertising.com](#)
- [atwola.com](#)
- [livefyre.com](#)

Reset the graph

Hide inactive sites

Hide the sidebar

Hide the tracking counter

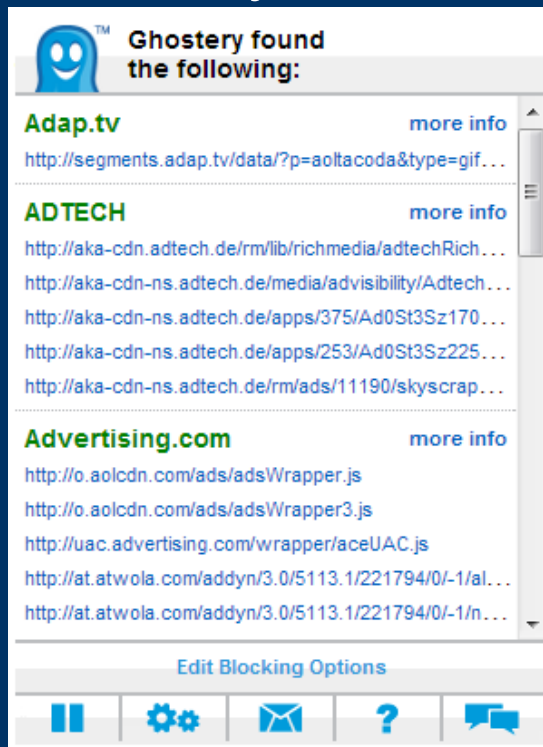
Show the instructions

Privacy: We collect info about the sites you go to only to illustrate how they're



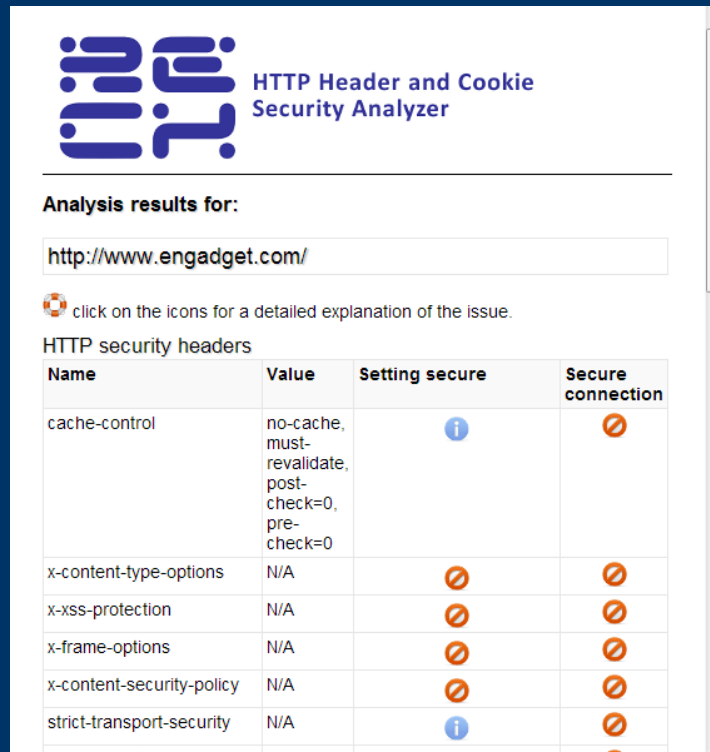
Related solutions

- Ghostery



Related solutions

- Recx security analyzer



HTTP Header and Cookie Security Analyzer

Analysis results for:

<http://www.engadget.com/>

click on the icons for a detailed explanation of the issue.

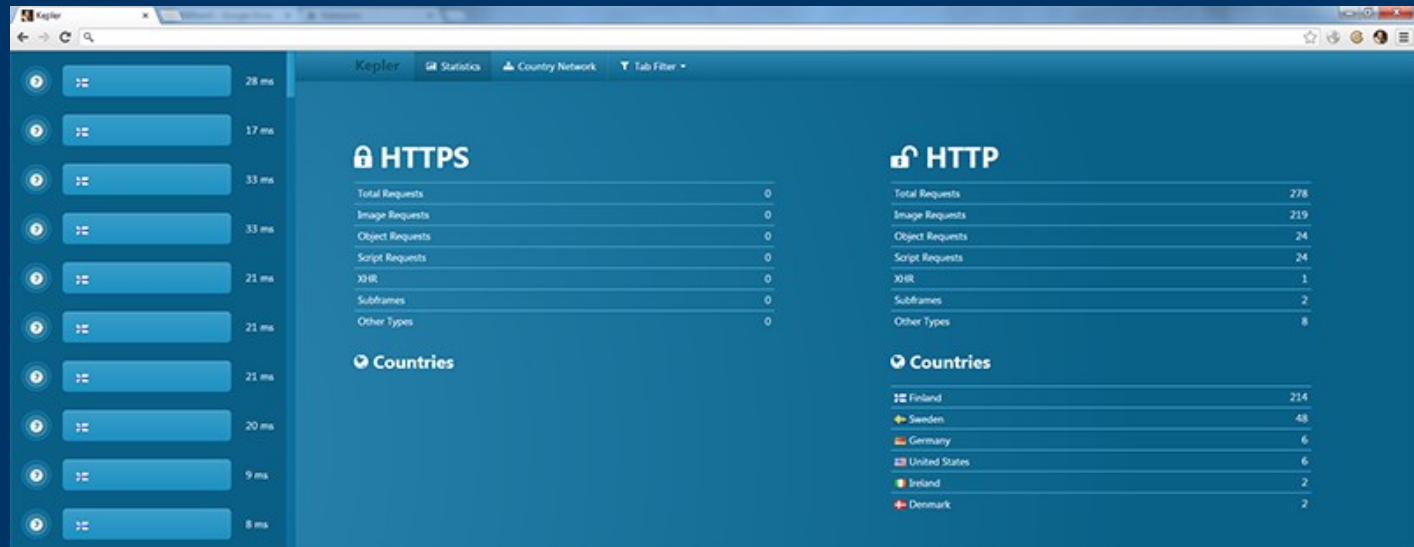
HTTP security headers

Name	Value	Setting secure	Secure connection
cache-control	no-cache, must-revalidate, post-check=0, pre-check=0		
x-content-type-options	N/A		
x-xss-protection	N/A		
x-frame-options	N/A		
x-content-security-policy	N/A		
strict-transport-security	N/A		

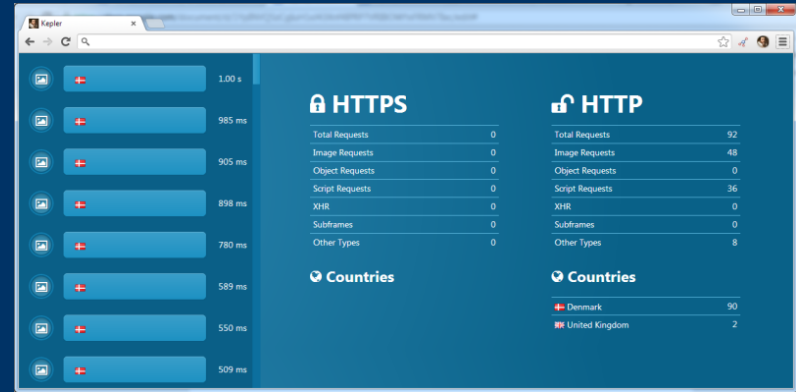
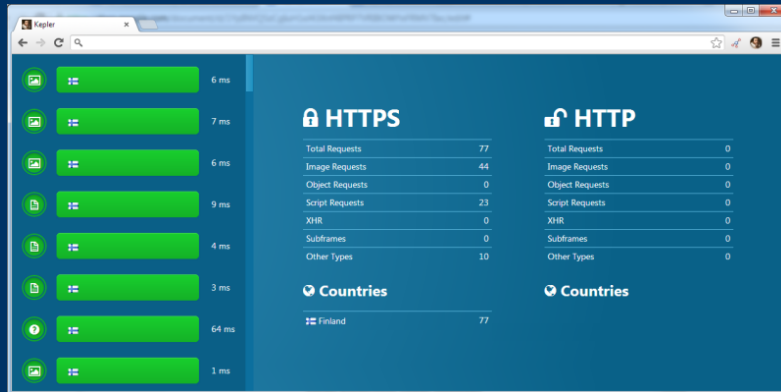


Our solution

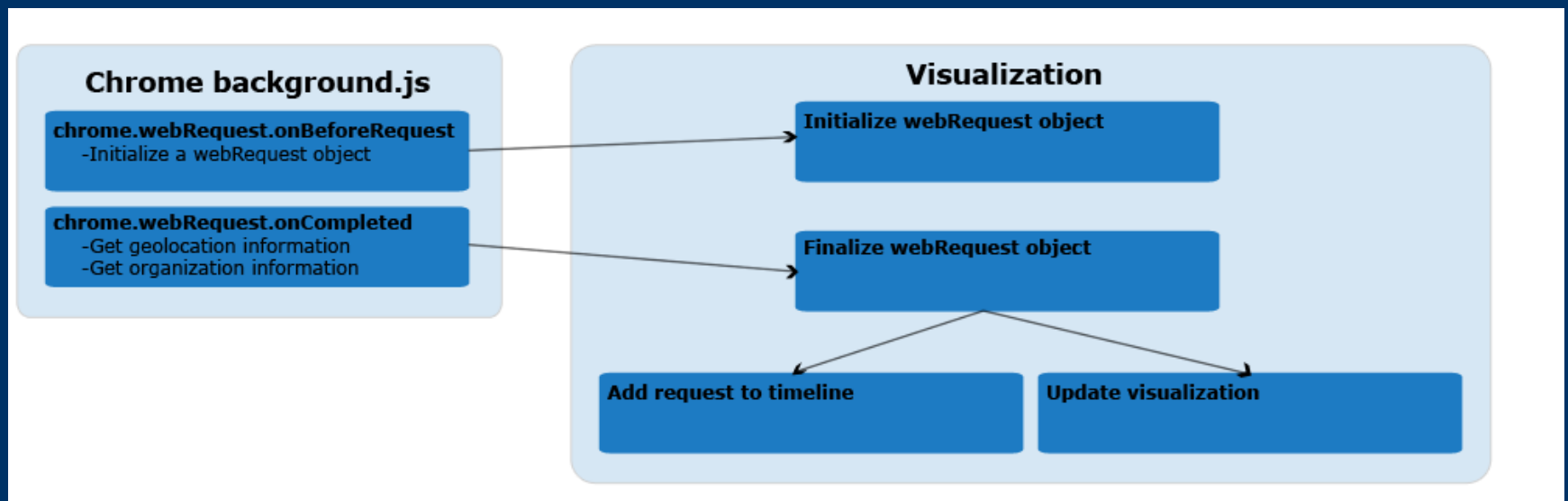
- Kepler



HTTPS vs HTTP



Architecture





Contributors

- Thomas Wahlberg – Project, back-end, architecture
- Petri Paakkola – Front-end, design, architecture
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Questions?

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