ENGENSEC
Educating the Next generation experts in Cyber Security

Tempus

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Internet Artefacts

Digital Forensic

Developers:
C. Yesil

Browser Artifacts

- Which kinds of Browsers exists
  - Chromes
  - Firefox
  - Internet Explorer
  - Safari
  - Opera

Webbrowser functionality and artifacts

- Functions
  - Browse internet
  - Incognito / InPrivate / Private browsing
  - Sandboxing
  - Upload/download files
  - User data / Profile
  - Add-ons/extensions/plugins

- Artifacts
  - Bookmarks
  - History (browse, form, search, download)
  - Cache
  - Cookies
  - Stored credentials
  - Settings / Configuration

Browser Artifacts

- Evidence Left Behind:-
  - Cache
  - Bookmarks
  - Browsing History (visited URLs)
  - Cookies
  - Downloads
  - Stored credentials

Browser Artifacts
Internet Explorer

- Windows 7
  - C:\Users\user\AppDataLocal\Microsoft\Windows\Temporary Internet Files\
- Windows 8-10
- Extensible Storage Engine *.edb/.dat – JETBlue-Files–
- WebCacheV01.dat

Browser Artifacts
Mozilla Firefox

- %\Users\[Nutzer]\AppData\Roaming\Mozilla\Firefox\Profiles\[Profil-ID]\

- addons.sqlite
- Bookmarks.html
- places.sqlite
- cookies.sqlite
- formhistory.sqlite
- signons.sqlite

Browser Artifacts
Chrome

- %\Users\[Nutzer]\AppData\Local\Google\Chrome\User Data\default
- History
- Cookies
- Logindata .....

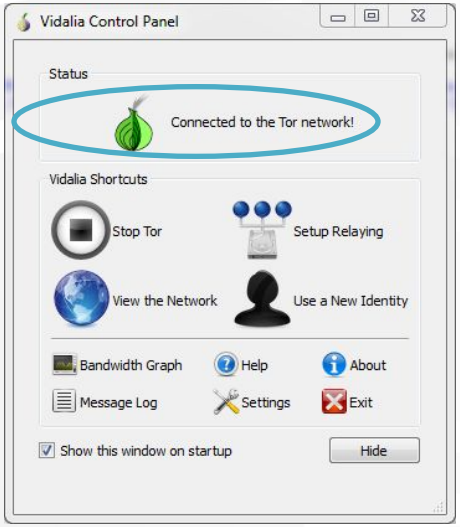
Anonymous Browsing - Tor

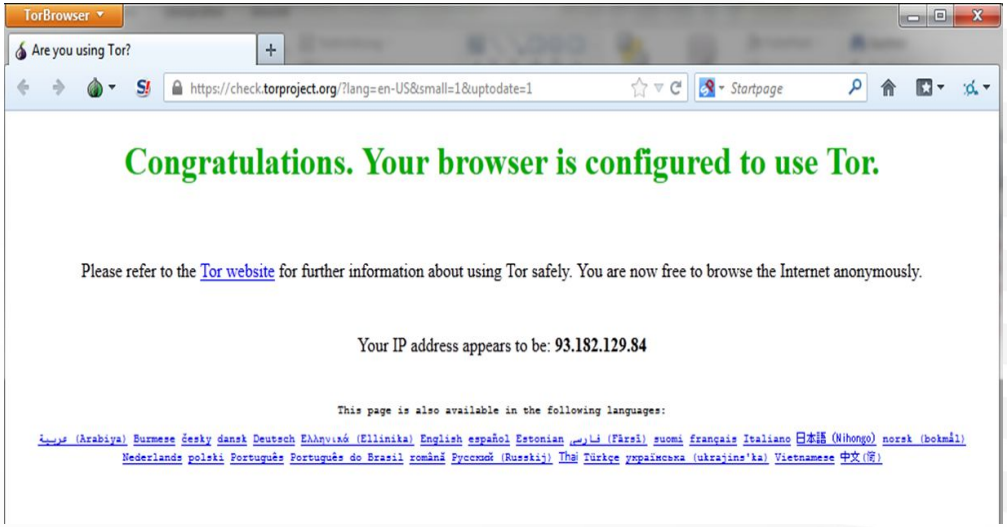
- Tor (**T**he **O**nion **R**outer)
- Portable browsers (Tor browser bundle, Portable FF)
- Use on Windows, Mac OS X, or Linux without needing to install
- Run off USB flash drive
- https://www.torproject.org
- Tor Add-On Firefox

Anonymous Browsing - Tor

- Tor Browser websites transmitted via Tor
- Runs Private Mode (website history & cookies etc. deleted)
- Only trace evidence RAM
  - RAM capture
  - RAM carving (.tor, .onion URLS)
  - Pagefile.sys (possibly)
  - Check internet history for proxies

Anonymous Browsing - Tor





New IP Address!

Anonymous Browsing - Tor

- Live operating system
- Run from DVD, USB or SD card.
- Preserves **privacy** and **anonymity**
  - Internet **anonymously** - connections go through Tor network
  - Application connecting directly to Internet - automatically **blocked**
  - Leaves **no trace** of Web Browser artifacts on the computer
- Download from https://tails.boum.org/index.en.html

Anonymous Browsing - TAILS

- Live operating system
- Run from DVD, USB or SD card.
- Preserves **privacy** and **anonymity**
  - Internet **anonymously** - connections go through Tor network
  - Application connecting directly to Internet - automatically **blocked**
  - Leaves **no trace** of Web Browser artifacts on the computer
- Download from https://tails.boum.org/index.en.html

Example Firefox Practical

- Stores information about visited Websites in SQLite Database
  - **On Win7/Vista:**

C:\Users\%USERNAME%\AppData\Roaming\Mozilla\Firefox\Profiles

\%PROFILE%.default\places.sqlite

  - **On XP:**

C:\Documents and Settings\%USERNAME%\Application Data\Mozilla\Firefox\Profiles\%PROFILE%.default\places.sqlite

  - **On Mac/OSX**

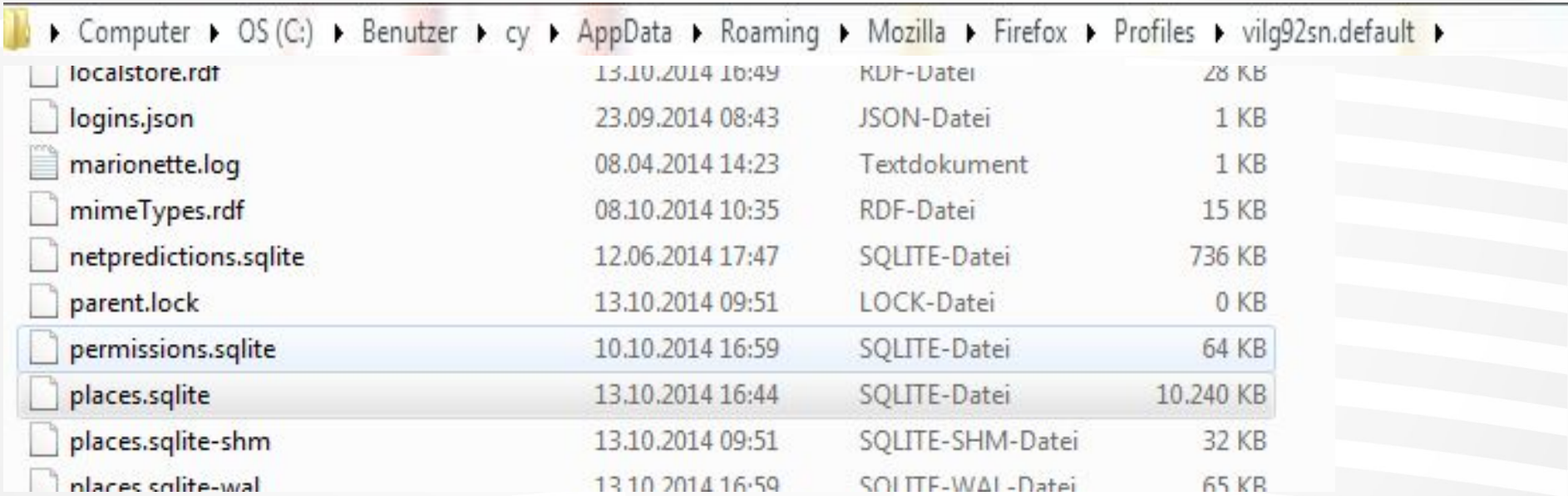
/Users/$USER/Library/Application Support/Firefox/Profiles/$PROFILE.default/places.sqlite

  - **On Linux**

/home/$USER/.mozilla/firefox/$PROFILE.default/places.sqlite

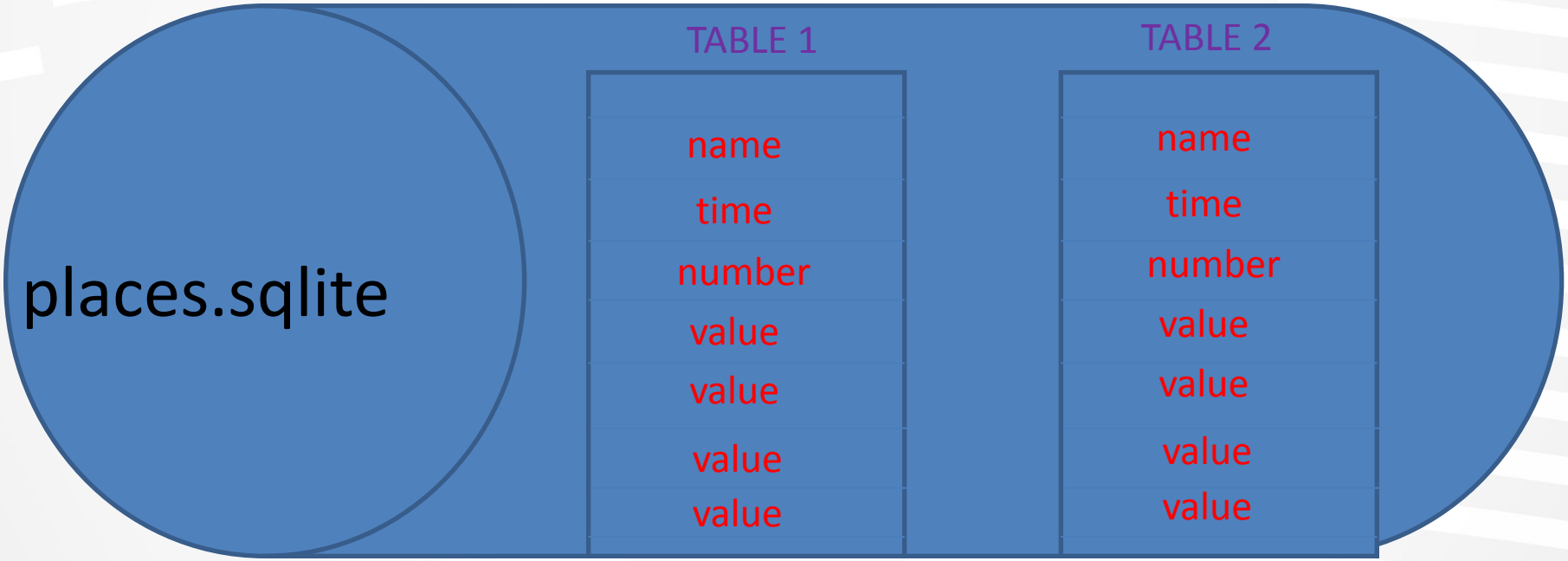
Firefox Practical

- Locate places.sqlite



Firefox Practical

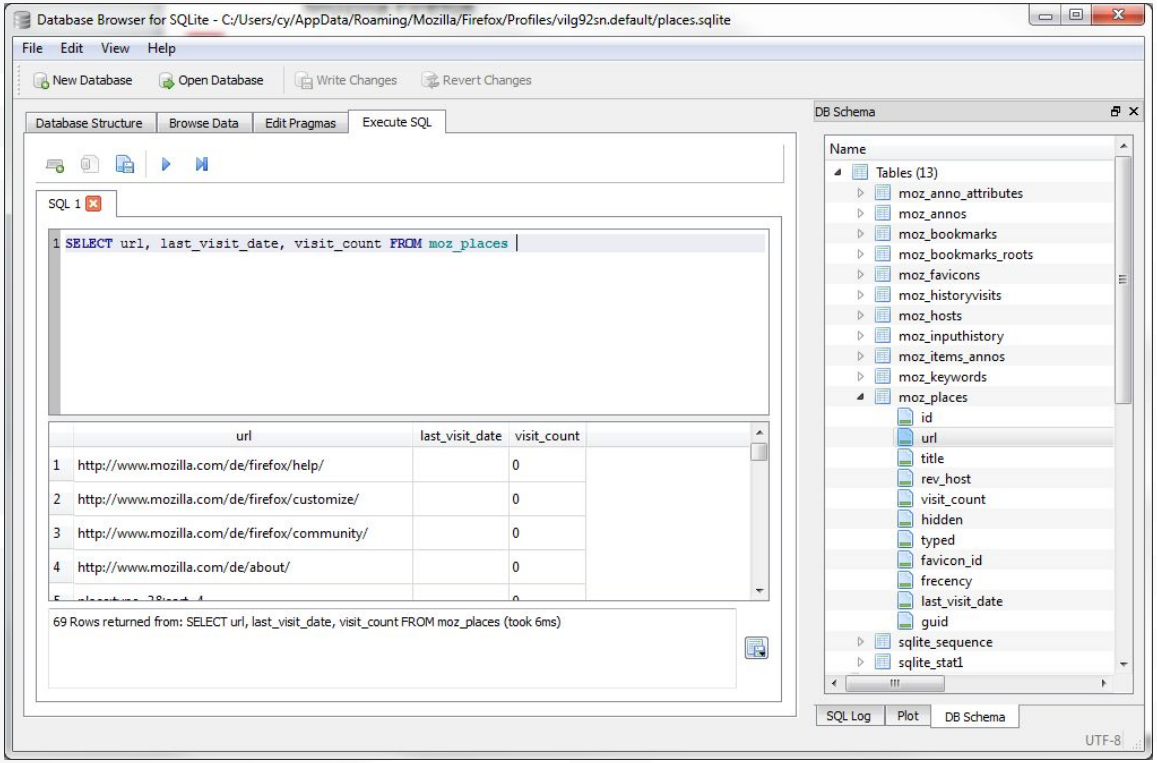
SELECT name, time, number FROM TABLE1



Firefox Practical

- **Overview of visited Websites**

SELECT url, last_visit_date, visit_count FROM moz_places

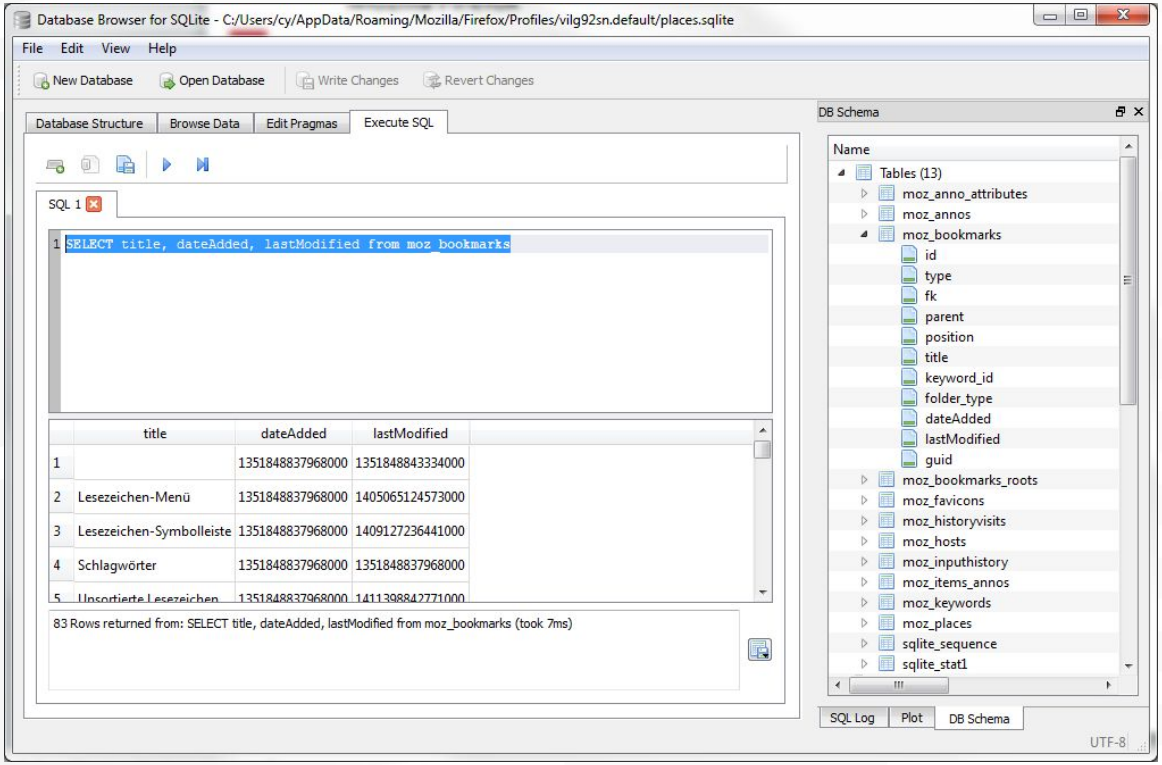


SELECT datetime(moz_places.last_visit_date/1000000, 'unixepoch', 'localtime'), url FROM moz_places

Firefox Practical

- **Bookmarks**

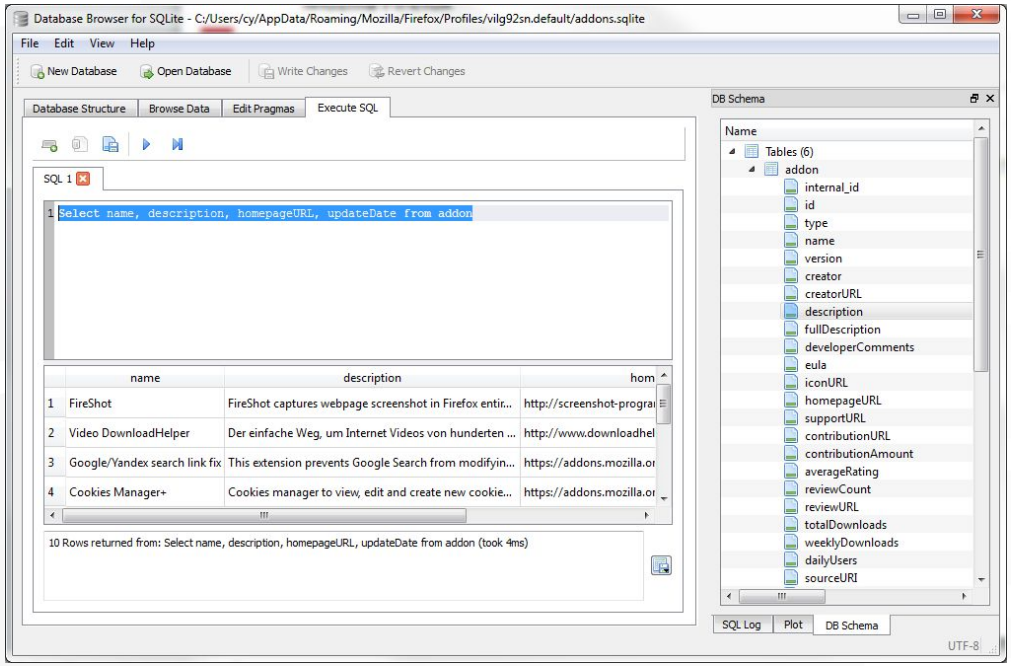
SELECT title, dateAdded, lastModified FROM moz_bookmarks



Firefox Practical

- **AddOns**

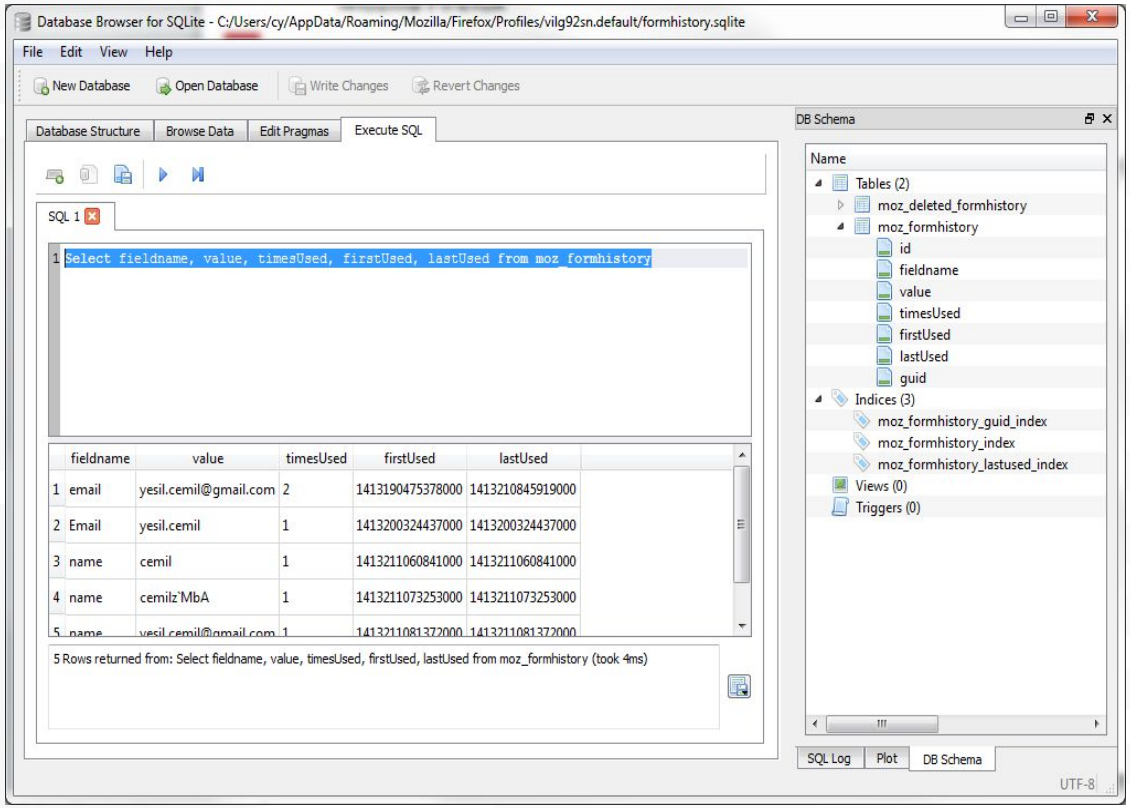
SELECT name, description, homepageURL, updateDate FROM addon



Firefox Practical

- **Form data**

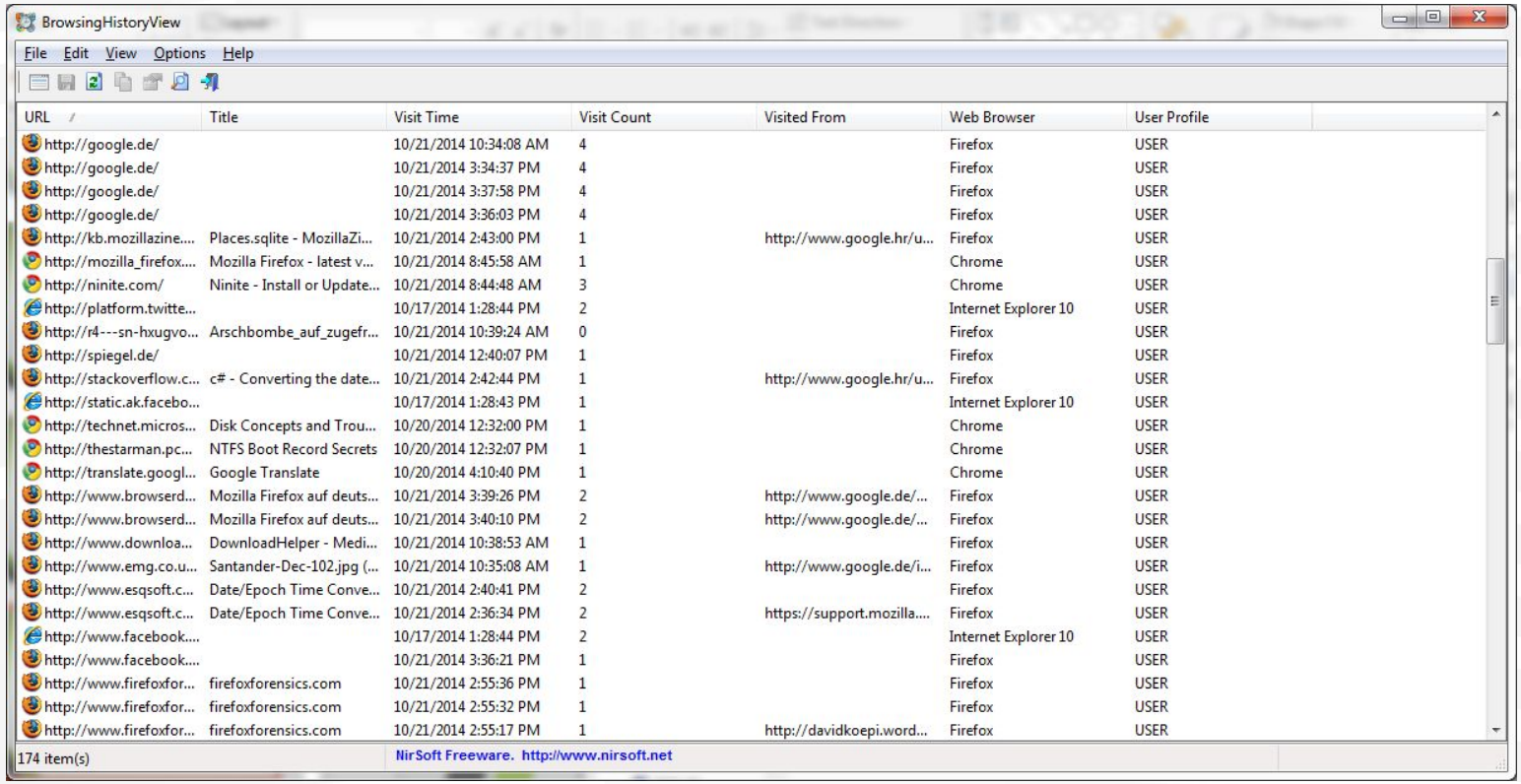
SELECT fieldname, value, timesUsed, firstUsed, lastUsed FROM moz_formhistory



Firefox Practical

Tools

- FreeTools
  - Nirsoft (http://www.nirsoft.net/utils/browsing_history_view.html)



Firefox Practical

All preferences of the User-Profile is stored in

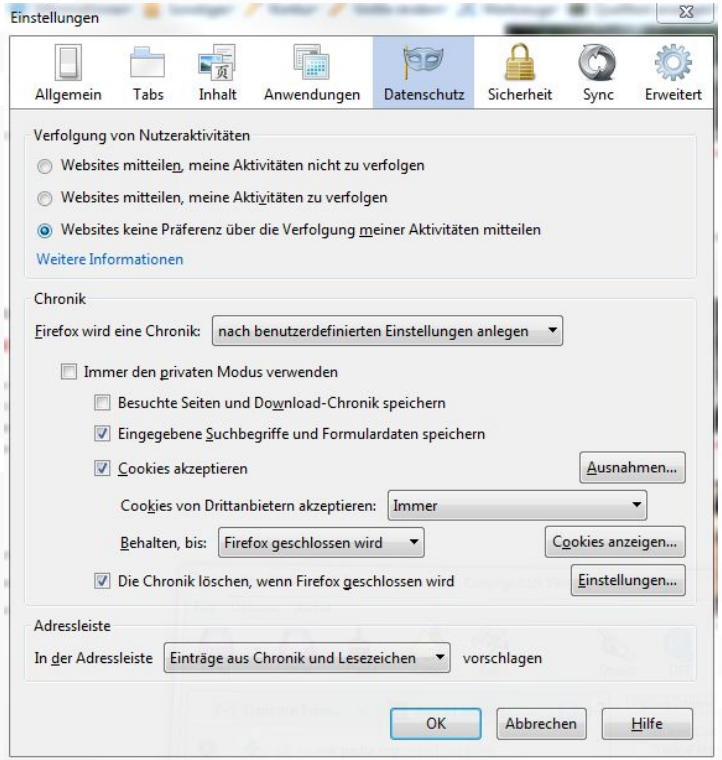
- about:config
- C:\Users\%USER%\AppData\Roaming\Mozilla\Firefox\Profiles\%Profile%\prefs.js

```
# Mozilla User Preferences

/* Do not edit this file.
 *
 * If you make changes to this file while the application is running,
 * the changes will be overwritten when the application exits.
 *
 * To make a manual change to preferences, you can visit the URL about:config
 */

user_pref("accessibility.typeaheadfind.flashBar", 0);
user_pref("app.update.lastUpdateTime.addon-background-update-timer", 1413187296);
user_pref("app.update.lastUpdateTime.background-update-timer", 1413187056);
user_pref("app.update.lastUpdateTime.blocklist-background-update-timer", 1413187416);
user_pref("app.update.lastUpdateTime.browser-cleanup-thumbnails", 1413212016);
user_pref("app.update.lastUpdateTime.experiments-update-timer", 1413187176);
user_pref("app.update.lastUpdateTime.search-engine-update-timer", 1413208536);
user_pref("app.update.migrated.updateDir", true);
user_pref("browser.bookmarks.restore_default_bookmarks", false);
user_pref("browser.cache.disk.capacity", 358400);
user_pref("browser.cache.disk.smart_size.first_run", false);
user_pref("browser.cache.disk.smart_size.use_old_max", false);
user_pref("browser.cache.disk.smart_size_cached_value", 358400);
user_pref("browser.cache.frecency_experiment", 2);
user_pref("browser.customizemode.tip0.shown", true);
user_pref("browser.download.dir", "G:\\Downloads");
user_pref("browser.download.folderList", 2);
user_pref("browser.download.importedFromSqlite", true);
user_pref("browser.download.lastDir", "C:\\Users\\cx\\Desktop\\Hacker");
user_pref("browser.download.manager.alertOnEXEOpen", true);
user_pref("browser.download.panel.firstSessionCompleted", true);
```

Privatemode
No history is stored



Oportunities:

Crash Report
RAM-Dump