Tracking in emails
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Tracking on the web
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General discussion
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Digital privacy @UM
Introduction to tracking methods

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Outline

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Demo

Let's look at an email sent by the UM...

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What?

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What happens when I click on that link?

- Internet: the big network of computers
  - Every computer has an address
  - Some computers have names
- Web $\approx$ HTTP: one thing done on the internet
  - One way computers talk to each other

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What happens when I click on that link?

Visiting a webpage (approximately):

My computer looks up address of umprivacy.nl.eu.org
My computer (127.0.0.1): Hey, can I have /about.html
umprivacy.nl.eu.org (168.0.0.1): Sure, here you go:
(requested file follows)

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What happens when I click on that link?

My computer looks up address of umprivacy.nl.eu.org
My computer (127.0.0.1): Hey can I have
`/9P4GDAoAkcW6mCMpsOX5kcu/0eLlIXYEmXWzdbloVsed46K`
umprivacy.nl.eu.org (168.0.0.1): Redirecting you to...
`http://example.org/actual-link`

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What can this be used for?

- Information available to the server: requested URL (contains identifier), time, IP address
- Because of the identifier, the server knows it's you!
- Server can know: which links in the email you clicked on, at what time, from which IP address

Ethics

- Technique used by e-marketers
  - Their goal: make more money out of you
  - Collecting information is not neutral
- Do you think people clicking these links know what's going on?

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HTML vs normal text

- Hiding links not possible in plain-text emails
- Saves bandwidth, customisable reading experience
- Images: attach them! Emphasis: use *asterisks*!
    - Images often not loaded by default anyway, for privacy reasons
- HTML email often turned on by default

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Recommendations

Switch to plain-text email.

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What are cookies?

How HTTP actually looks:

```
GET /about.html HTTP/1.1
Host: umprivacy.nl.eu.org
Otherheader: value

HTTP/1.1 200 OK
Content-Type: text/html
Header-Name: value
```

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What are cookies?

Cookies:

```
HTTP/1.1 200 OK
Content-Type: text/html
Set-Cookie: lang=en; Expires=Thu, 31 Mar 2022 01:00:00 GMT
Set-Cookie: session-id=0eLlIXYEmXWzdbloVsed46K; Expires=Fri,
25 Mar 2022 01:00:00 GMT

GET /about.html HTTP/1.1
Host: umprivacy.nl.eu.org
Cookie: lang=en; session-id=0eLlIXYEmXWzdbloVsed46K
```

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UM website cookie consent

Let's visit `https://maastrichtuniversity.nl`...

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Pretty sure that's a GDPR violation...

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Legitimate uses of cookies

- Accounts
- Settings

Others: site has to work if users delete them
Better way: per-cookie consent

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Considerations

- Are these statistics useful?
    - Do not capture loss of trust
    - Pay for contextual feedback
- Are they long-term viable?
    - People learn to work around the consent popups

Recommendation: try per-cookie consent!

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Fingerprinting

Are settings cookies also dangerous?

- Many small pieces of information can be combined

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Fingerprinting: HTTP User-Agent header

```
GET /about.html HTTP/1.1
Host: umprivacy.nl.eu.org
Referer: maastrichtuniversity.nl
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; rv:103.0esr)
Gecko/20110101 Firefox/103.0esr/EwtFtSPGUhSNLKdN
```

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Fingerprinting: JavaScript

JavaScript: code that the browser executes on your computer for the website
Lot of information exposed to JS
Canvas for unique fingerprints

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IP tracking

Your IP address often doesn't change much
IPv4 is (very slowly) being replaced with IPv6, though

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Online trackers

"Websites" that don't offer content, just track users around
Trackers are on **many** websites

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Again: drawbacks of complexity

We saw how JavaScript creates privacy risks.
A complicated website is also bad for:

- people with slow internet
- people with a slow computer or an old browser
- people who use a screen reader

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"Well I have nothing to hide..."

Privacy is critical to a free society.

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Why should UM care?

Public institution
Also counter-productive

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Software

Browser extensions:

- Privacy Badger
- Cookie Autodelete
- JShelter

Tor

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Websites

Info:

- eff.org

Alternatives to user-hostile webservices:

- degooglisons-internet.org/en/alternatives/
- prism-break.org

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Image credits

Shocked alligator: "Gator Mouth", by Molly Martin, US Fish & Wildlife Service
Disappointed man: painting on unnamed hanging scroll, by Tsutsumi Togetsu, c. 1800
Both PD, both via WM Commons

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End

Thank you so much for listening!
Please ask questions!