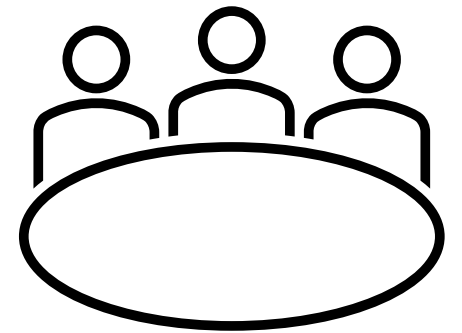# Innsjekk

Hva?

- Uformell, ved starten av dagen
- Mulighet til å dele noe med de andre i gruppen om hvordan du har det (feks. jeg er litt nervøs, spent på dagen, trøtt, …)

Hvordan?

- Si gjerne også hvem du er, hvor du kommer fra
- Fortell kort noe om hvordan du har det? Hvordan har starten på dagen vært?
- 2-3 min. per person

NTNU | Kunnskap for en bedre verden

Short Repetition of Day 3

- Redundante strukturer krever ekstra utstyr som øker kostnader (CAPEX = invesetering og drift)
- Hvordan bygge redundante struktuer?
- Hvordan beregne påliteligheten av en web-tjeneste mellom klient og server?
- Forskjellen mellom tilfeldige feil og målrettede angrep
- Viktig å beskytte informasjonen om system-struktur
- Mer om dette i TTM4185, TTM4110 ("PYSE"), [og TTM4158]
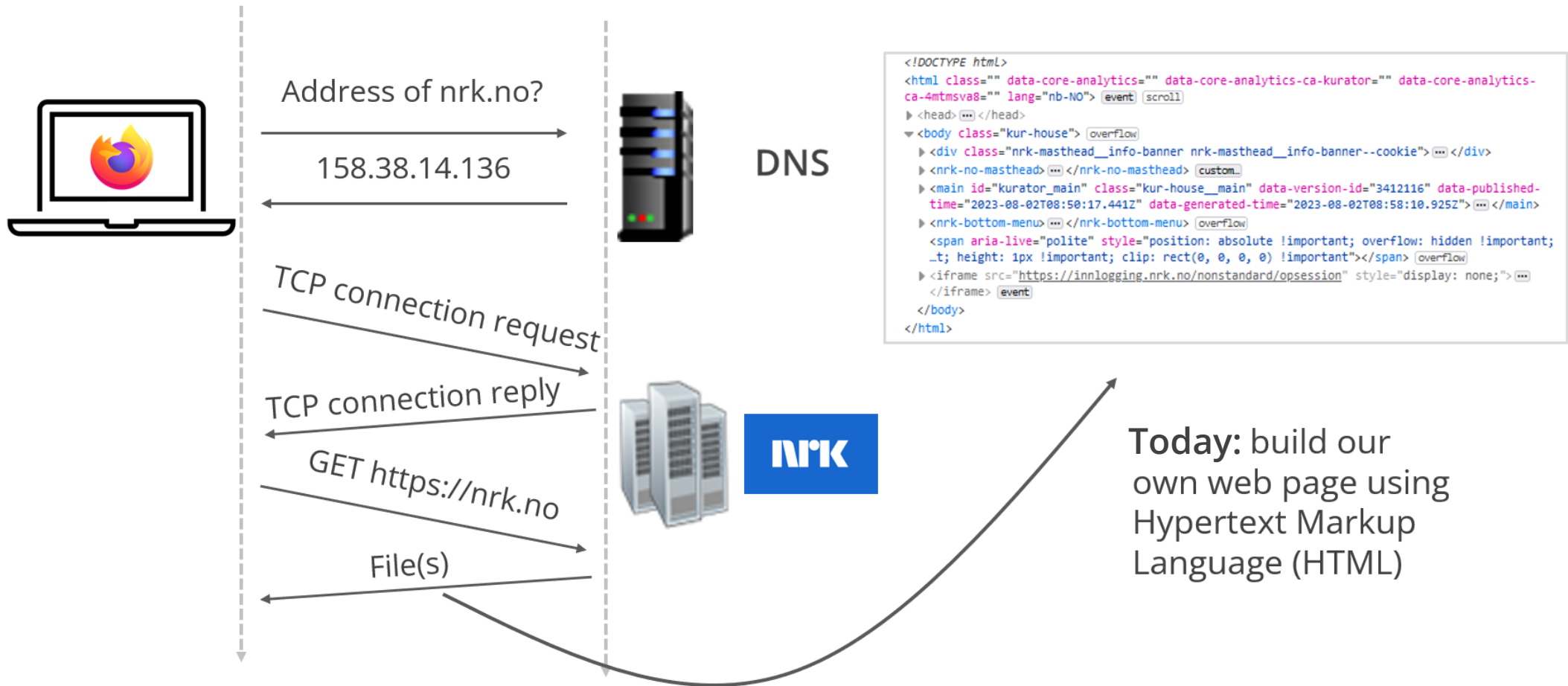
Goals for the Day
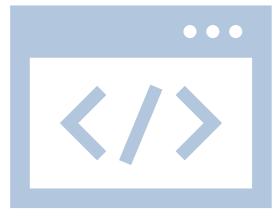
Understand how websites are created and served

What is HTML and how does it work?
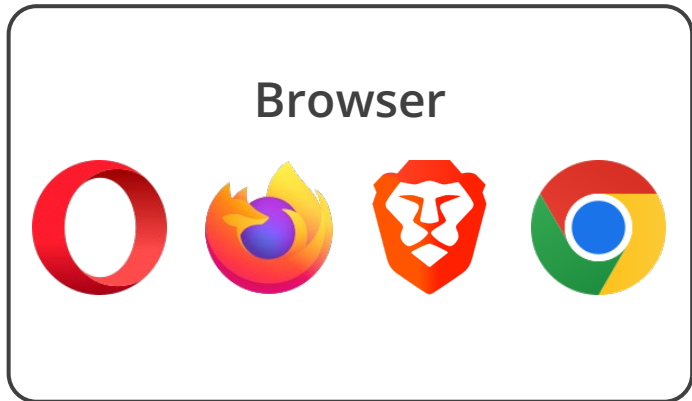
Build your own website and share it with the world

Context from Day 1

Address of nrk.no?

158.38.14.136

DNS

TCP connection request

TCP connection reply

GET https://nrk.no

File(s)

nrk

```
<!DOCTYPE html>
<html class="" data-core-analytics="" data-core-analytics-ca-kurator="" data-core-analytics-
ca-4mtmsva8="" lang="nb-NO"> event  scroll
  ▶ <head> … </head>
  ▼ <body class="kur-house"> overflow
    ▶ <div class="nrk-masthead__info-banner nrk-masthead__info-banner--cookie"> … </div>
    ▶ <nrk-no-masthead> … </nrk-no-masthead> custom…
    ▶ <main id="kurator_main" class="kur-house__main" data-version-id="3412116" data-published-
      time="2023-08-02T08:50:17.441Z" data-generated-time="2023-08-02T08:58:10.925Z"> … </main>
    ▶ <nrk-bottom-menu> … </nrk-bottom-menu> overflow
      <span aria-live="polite" style="position: absolute !important; overflow: hidden !important;
      …t; height: 1px !important; clip: rect(0, 0, 0, 0) !important"></span> overflow
    ▶ <iframe src="https://innlogging.nrk.no/nonstandard/opsession" style="display: none;"> … 
      </iframe> event
    </body>
</html>
```

Today: build our own web page using Hypertext Markup Language (HTML)

Context from Day 1

```
<!DOCTYPE htmL>
<html class="" data-core-analytics="" data-core-analytics-ca-kurator="" data-core-analytics-
ca-4mtmsva8="" lang="nb-NO"> event  scroll
▶ <head> ⋯ </head>
▼ <body class="kur-house"> overflow
  ▶ <div class="nrk-masthead__info-banner nrk-masthead__info-banner--cookie"> ⋯ </div>
  ▶ <nrk-no-masthead> ⋯ </nrk-no-masthead> custom…
  ▶ <main id="kurator_main" class="kur-house__main" data-version-id="3412116" data-published-
    time="2023-08-02T08:50:17.441Z" data-generated-time="2023-08-02T08:58:10.925Z"> ⋯ </main>
  ▶ <nrk-bottom-menu> ⋯ </nrk-bottom-menu> overflow
    <span aria-live="polite" style="position: absolute !important; overflow: hidden !important;
    …t; height: 1px !important; clip: rect(0, 0, 0, 0) !important;"></span> overflow
  ▶ <iframe src="https://innlogging.nrk.no/nonstandard/opsession" style="display: none;"> ⋯
    </iframe> event
  </body>
</html>
```

Web Application Structure

Browser

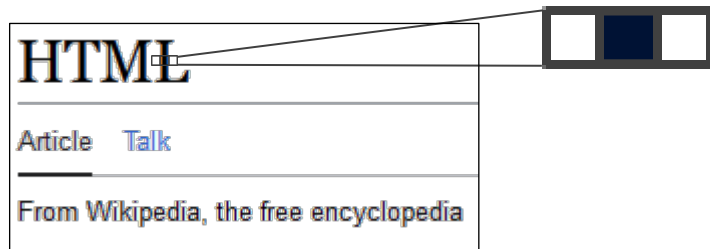HyperText Transfer Protocol (HTTP)

Web Server

- HyperText Markup Language (HTML) **describes** documents
- Browsers interpret the description and render the page
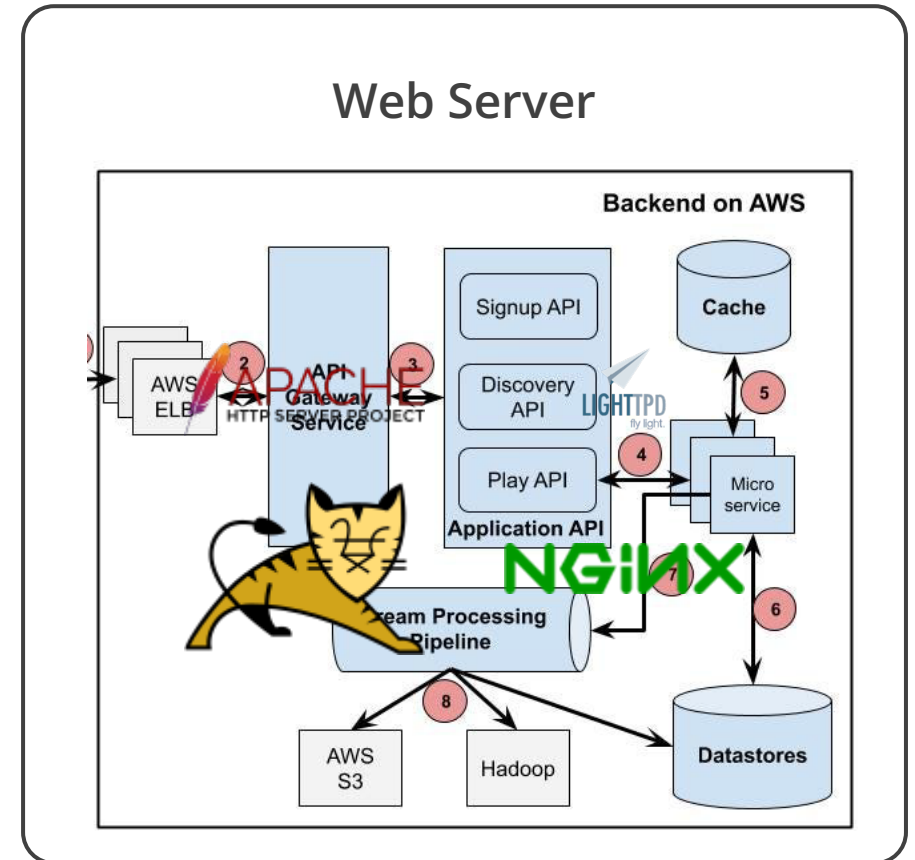
Different Representations

Pixel-based

- Fixed size / resolution
- Color information for each coordinate

Declarative

```
<h1>HTML</h1>
<span>Article</span>
…
```

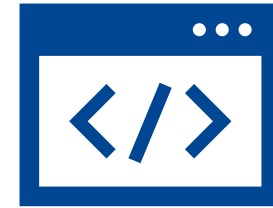- Content annotated with tags that supply meaning & formatting

Preparation – Get Firefox

Installation

Mac: https://support.mozilla.org/en-US/kb/how-download-and-install-firefox-mac

Windows: https://support.mozilla.org/en-US/kb/how-install-firefox-windows

Accessing devtools

Mac: Cmd + Opt + I

Windows: F12

➤ Explore the different tabs, especially inspector & network

Simple Text File

- Pick your favorite editor

- Create a plain text file

- Save it as .html

- Open it in a browser
  - ➔ Outcome?

- Content, but without structure & formatting
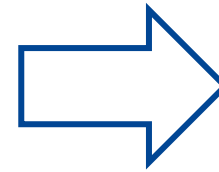
Sublime Text   Notepad++   VS Code   PhpStorm

C: > Users > stas > <> mypage.html

```
1    TTM4175
2    Teknostart Dag 4
3    Læringsmålene for i dag
4    Hvordan fungerer HTML?
5    Vi lager vår egen nettside.
6
```

Adding Annotations

```html
<h1>TTM4175</h1>
<h2>Teknostart Dag 4</h2>
<p>Læringsmålene for i dag</p>
<ul>
  <li>Hvordan fungerer HTML?</li>
  <li>Vi lager vår egen nettside.</li>
</ul>
```

TTM4175

Teknostart Dag 4

Læringsmålene for i dag

- Hvordan fungerer HTML?
- Vi lager vår egen nettside.

- Content surrounded by opening and closing **tags**

- Tags create **elements** such as headings (h1, h2), paragraphs (p), or lists / list items (ul, li)

- **Nesting** allows creating complex structure

Adding More Structure

- Document type
  - HTML version and structure, automatic validation[1]

- Actual HTML document
  - Root of hierarchical structure
  - Meta information via attributes

- Head / body
  - Broad separation into meta information / imports and visible content

```
<!DOCTYPE html>
<html lang="no">
    <head>
    </head>
    <body>
        <h1>TTM4175</h1>
        <h2>Teknostart Dag 4</h2>
        <p>Læringsmålene for i dag</p>
        <ul>
            <li>Hvordan fungerer HTML?</li>
            <li>Vi lager vår egen nettside.</li>
        </ul>
    </body>
</html>
```

[1] https://validator.w3.org/#validate_by_input

Towards Publishing Your Site

- Navigate to https://s.ntnu.no/nettside

- Follow the guide to connect to your directory

Webområder:

Nettverksområde	Beskrivelse
\\webedit.ntnu.no\brukernavn	Nettverksområde for nettsiden din (for studenter og ansatte) på folk.ntnu.no. Alle får leserettigheter til filer lagret her.

- ! Details matter and depend on your operating system / connection method when entering credentials

- Upload index.html and visit https://folk.ntnu.no/yourusername
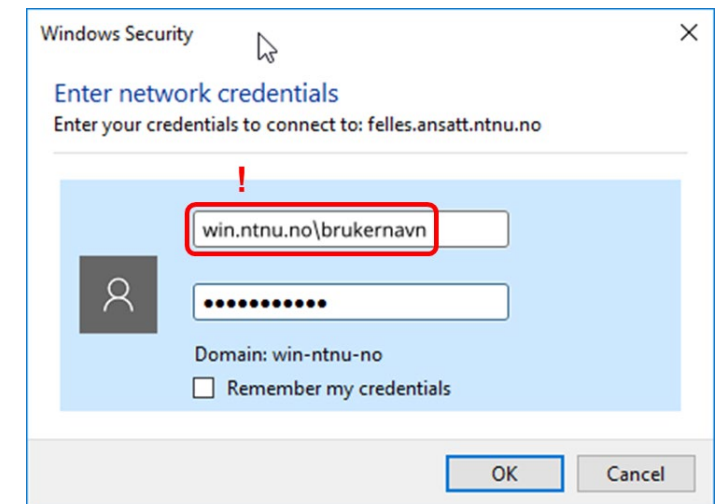
Accessing and Connecting Pages

- `https://folk.ntnu.no/xyz` defaults to opening `index.html` in user xyz's home directory

- Point to a specific file via `https://folk.ntnu.no/xyz/page1.html`

- Link pages using the <a> (anchor) tag

```
...
    <h1>Welcome to page 1</h1>
    <a href="page2.html">Go to page 2</a>                          Relative path
    <a href="https://folk.ntnu.no/xyz/page2.html">Go to page 2</a>   Absolute
    <a href="https://nrk.no">Check the news</a>                      paths
...
```

Attribute `href` (hypertext reference) of the <a> element

Bringing Life to Your Page: Styles

- Achieved by adding `style` attribute to regular elements
    - Pattern: `property1:value1;property2:value2;…`

```
...
<h1 style="font-size:150%;color:green;">TTM4175</h1>
<h2 style="font-family:verdana;background-color:lavender;">Teknostart Dag 4</h2>
<p>Læringsmålene for i dag</p>
<ul>
   <li style="color:blue;">Hvordan fungerer HTML?</li>
   <li style="color:blue;">Vi lager vår egen nettside.</li>
</ul>
...
```

- But: cumbersome maintenance and mix of style / content

Cascading Style Sheets (CSS)

- Commonly integrated as separate file(s)
- Syntax: **Selector** { **Style** }

styles.css
```css
h1 {
  font-size: 150%;
  color: green;
}
li {
  color: blue;
}
```

mypage.html
```html
<!DOCTYPE html>
<html lang="en">
  <head>
    <title>TTM4175</title>
    <link rel="stylesheet" href="styles.css">
  </head>
  <body>
    ...
  </body>
</html>
```

Relative path to style file

- Try the devtools inspector to temporarily edit styles

Create Your Own Group Page

- List group members
- Add a photo if you like
- Experiment with different HTML elements and CSS styles
- Show off your newly gained HTML skills!

➡ Share the link to your page with me via Teams / email (stanislav.lange@ntnu.no)
and I'll list it at https://s.ntnu.no/ts-pages

Reference / Cheat Sheets

- Overview of "ingredients" for building your page
    - https://developer.mozilla.org/en-US/docs/Learn/HTML/Cheatsheet
    - https://www.w3schools.com/tags/default.asp
    - https://web.stanford.edu/group/csp/cs21/htmlcheatsheet.pdf
- http://www.csszengarden.com/001/ one page – many flavors purely via CSS (001 → anything in 001..221)

Summary

- Introduction to web servers, HTML, CSS
- Hands-on "from empty text file to published web site"
- Gallery of results @ https://s.ntnu.no/ts-pages
- Additional topics to explore
  - JavaScript
  - Server-side programming
  - Frameworks
  - Higher-level languages
  - ...

CSS

HTML

JavaScript

Angular

React

Node.js

Kunnskap for en bedre verden
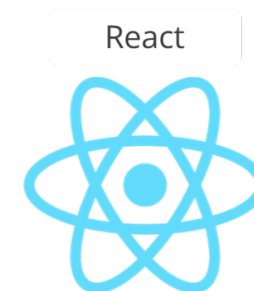
Next Session & Preparation

- The Linux Command Line Interface (CLI)
  - Learn basic commands for
    - Navigation
    - Remote access
    - Networking-related tasks
  - Understand basic virtualization principles

- Check ttm4175.iik.ntnu.no/unit-cli
  - ➡ Preparation: videos, readings, establishing connectivity
  - ➡ https://ttm4175.iik.ntnu.no/learning/learning.html

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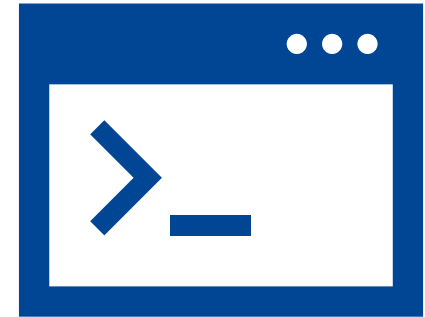
Evaluation of this week

Tell us how this week was for you:

https://s.ntnu.no/tekno

Evaluering av studiestart og Teknostart

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