GN Meeting 2020

A better GeoNetwork user experience

camptocamp
INNOVATIVE SOLUTIONS
BY OPEN SOURCE EXPERTS

GEOCAT
GOVERNMENT GEOGRAPHIC DATA PUBLISHING

titellus

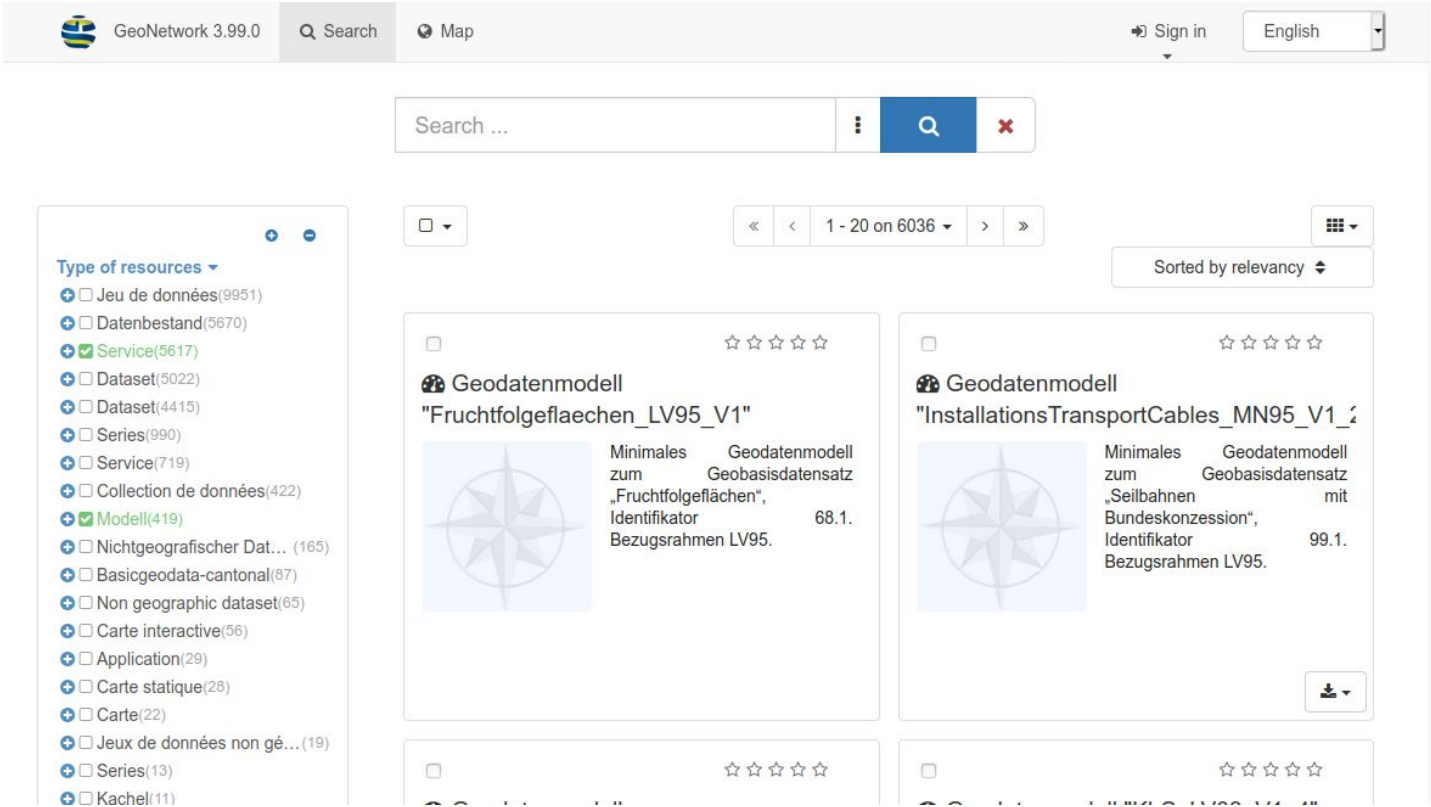
1. Introduction

What's up?

- GeoNetwork 4 around the corner!
- One huge change in the architecture (*Lucene* ➡️ *Elastic Search*)
- Several impacts on the current UI, but…
  ...did not warrant a larger refactoring.

- Thus, GN4 will feel familiar to users of the previous version.

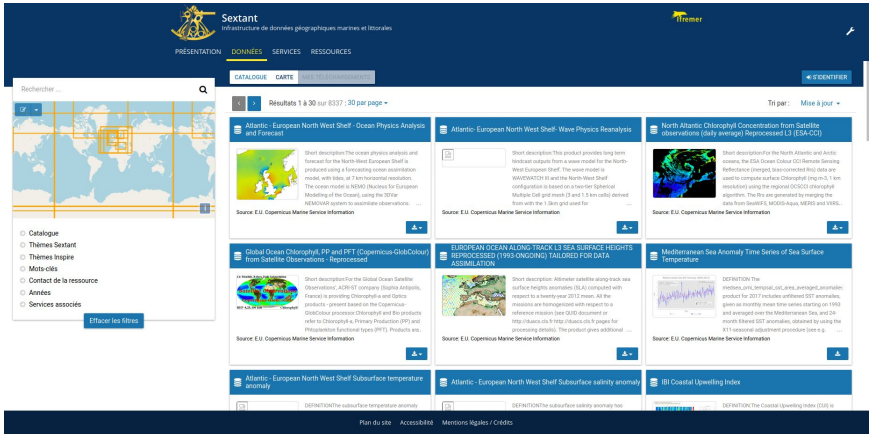
1. Introduction

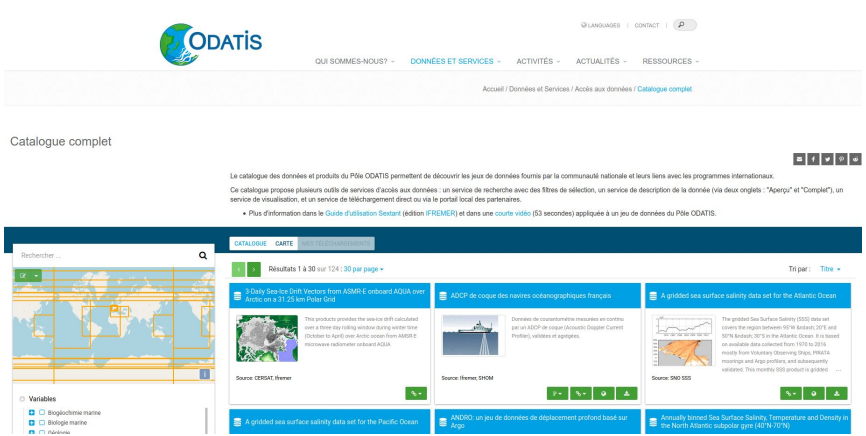


1. Introduction

Present-day struggles...

- Showcase: Sextant, a catalog managed by the Ifremer





  - Embeddable catalog on third party websites (with many options)
  - Custom themes for each

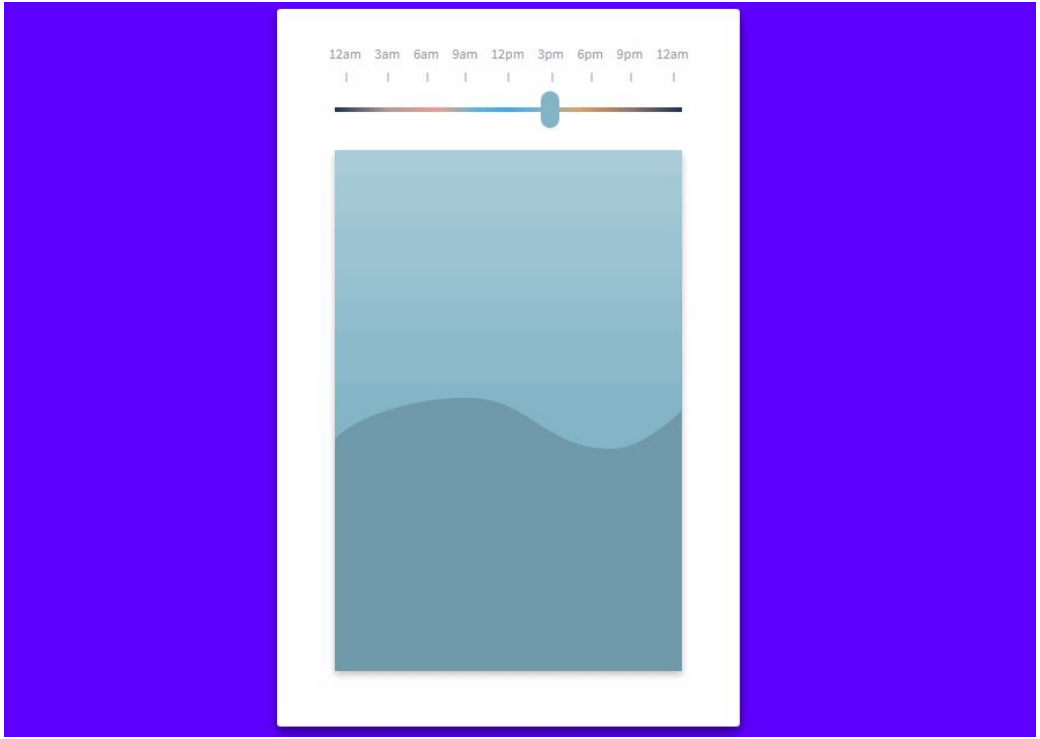
1. Introduction

...And emerging opportunities

- New interesting use cases have appeared over the years
  - Making several UI themes for different organizations
    ➡️ *Addressed in GN3.8 with portals*
  - Including only parts of a catalog in a host page, e.g. search results, full record…
  - Integrate better with other frontend applications (map viewer, metadata editor…)

- Recent JS frameworks are getting faster and lighter
- Browsers are stronger than ever!
  - Web Components to replace <iframe> and the like
  - CSS variables to allow dynamic styling

1. Introduction



1. Introduction

What's keeping us then?

- The current UI is embedded in the Java application
- This is a longstanding situation that comes with limitations:
  - Almost no way to migrate away from AngularJS (EOL is june 2021)
  - Complex and non-standard build system
  - Awkward to test and debug
  - A custom UI will require a complete fork of GeoNetwork
  - No way to keep up with the evolutions of the JS ecosystem!
- ...and with merits:
  - Easy to deploy: install once, get everything!
  - No cross-domain troubles, facilitate backend-frontend communication..

1. Introduction

But I like the UI!

- We do too! It is:
  - Extremely feature rich and mature
  - The result of years of collaborative work (thanks!)
  - Highly customizable with an extensive list of settings

- Unfortunately, it is also very costly to work with and maintain

1. Introduction

- Let’s face it:

  The GeoNetwork UI has reached a state where it cannot be refactored significantly anymore.

  …and that’s totally fine!

https://www.deviantart.com/built4ever/art/Castle-and-Village-Number-Two-334499398

2. A new frontend for GeoNetwork

2. A new frontend for GeoNetwork

Some forward thinking

- Overcoming the current limitations means rewriting the UI from scratch
- This does not have to be destructive: both the “present” and the “future” UI can live side-by-side, fulfilling different needs
- Maintenance efforts could go to the present UI, while new features could be directed towards the future UI
    - Less new features on the present UI means less maintenance required as well!

2. A new frontend for GeoNetwork

What benefits? (1)

- A complete rewrite would allow using a more recent framework, giving…
  - Better performance
  - Faster page loading
  - Better accessibility
  - Better code quality meaning...
  - Lower maintenance cost
  - More open to contributions

2. A new frontend for GeoNetwork

What benefits? (2)

- Revising the UI architecture might also give:
  - Better separation of concerns
  - No more monolithic structure, easier to migrate/evolve (= future proof)
  - Lower development costs
  - No full vendor lock-in
  - Pre-rendered content (better SEO!)
  - Lazy load parts of the application
  - Better developer experience!

2. A new frontend for GeoNetwork

A different approach

- The so-called “GeoNetwork UI” could offer much more than nowadays
- Instead of being a “one-size-fits-all” app, it could provide…
  - Several smart components usable in larger apps
  - Embeddable “mini-apps”, portable and working whatever the context
  - A couple of full-blown apps similar to the existing UI, using said components

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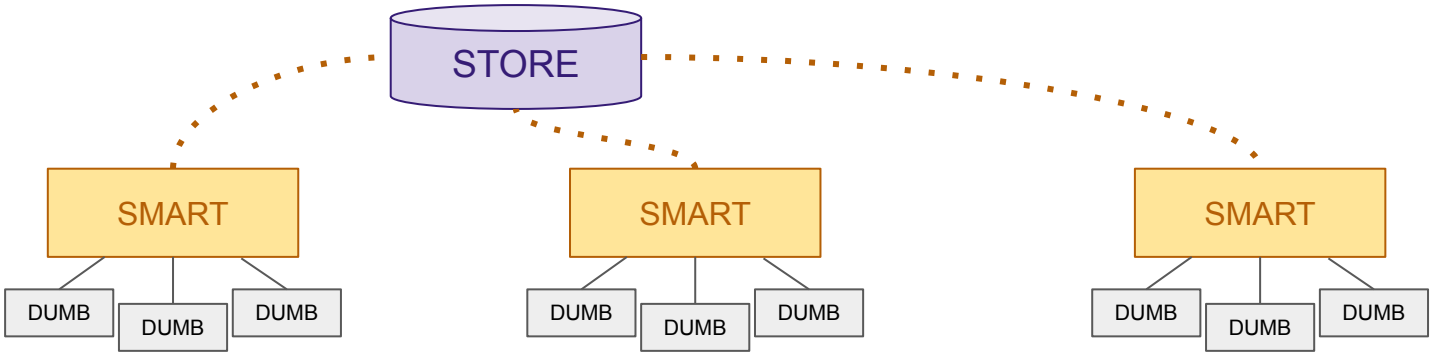
Smart components… smart how?

- Modern JS development often use the concept of smart/dumb components
- Smart components are responsible for fetching and preparing the data
- They typically interact with each other using a “store”



- In a larger app with a similar framework, these could blend in seamlessly!

2. A new frontend for GeoNetwork

Smart components… smart how? (2)

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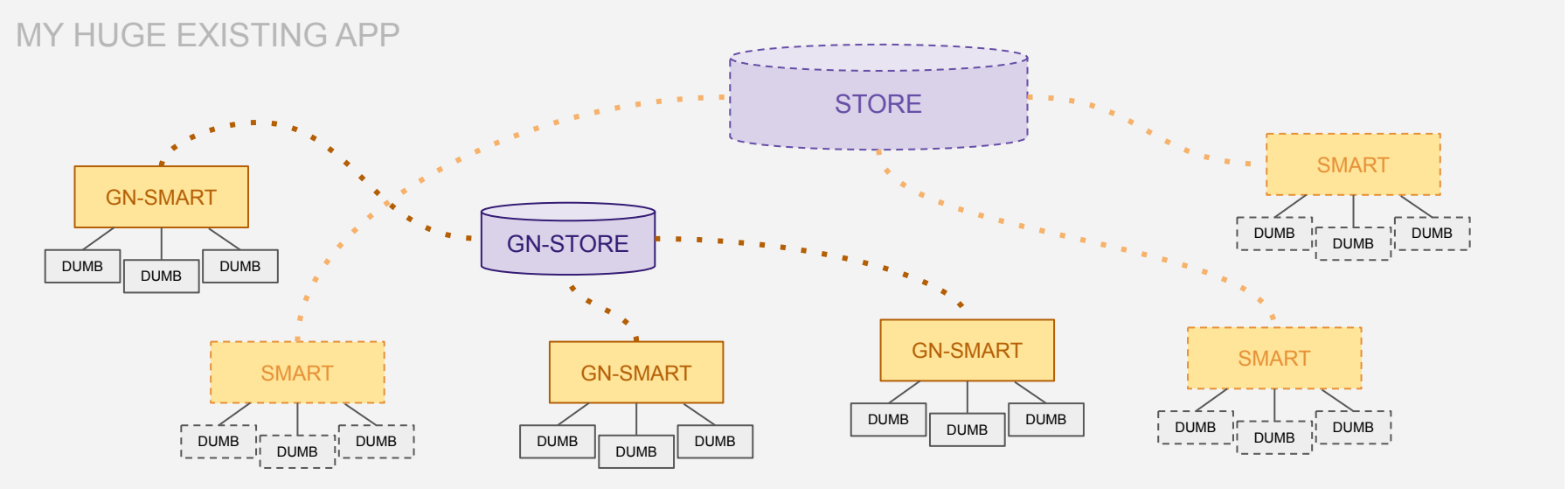

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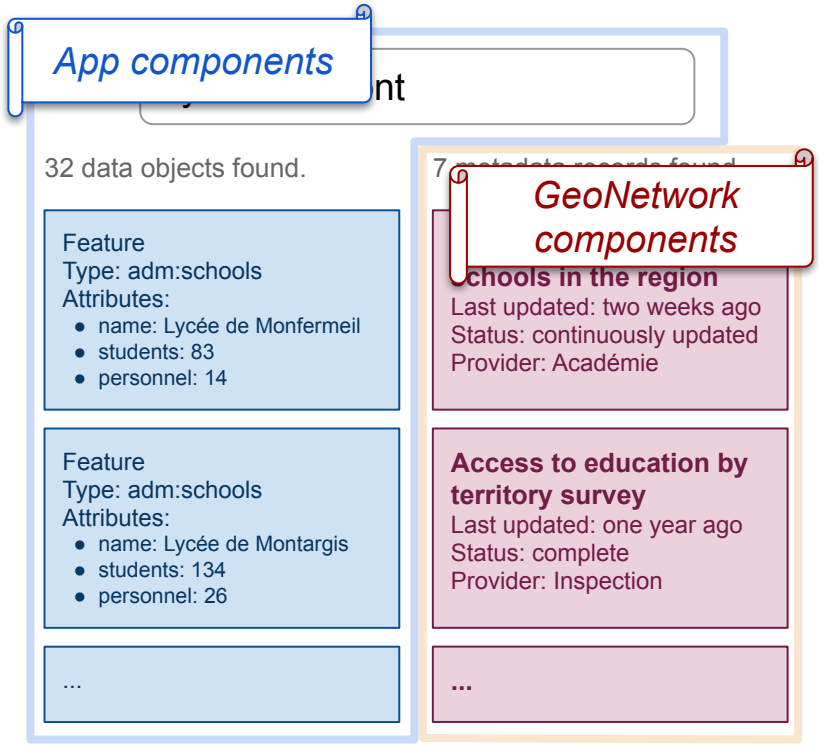
Smart components… smart how? (2)

- Practical example: an app providing a single entrypoint to data & metadata
  - The app could show a single text input which allows the user to search both for data services and metadata records
  - The text input and data-related results would be provided by the app components
  - The metadata records would be provided by the GeoNetwork components
  - Spatial search could also be implemented



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Smart components… smart how? (3)

- Summary:
  - Basic building blocks of any future GeoNetwork UI
  - Efforts put into these will benefit to all consumers down the line
  - Loosely coupled and composable (components do not depend on each other)
  - Useable in any other app using the same framework!

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Embeddable “mini-apps” (1)

- Very easy to include:
  - Only one file to load
  - Add an element in the HTML with the required input & style, e.g.

```
<gn-quicksearch
  api-url="https://mycatalog.org/geonetwork/srv/api"
  org-filter="sample-organization"
  main-color="#FF328C"
  secondary-color="lightgrey" />
```

  - No requirements, no conflicts with the host page
  - Uses the WebComponents standards (W3C), widely adopted
- Uses GeoNetwork smart components internally
- Each mini-app is tailored for a specific use case

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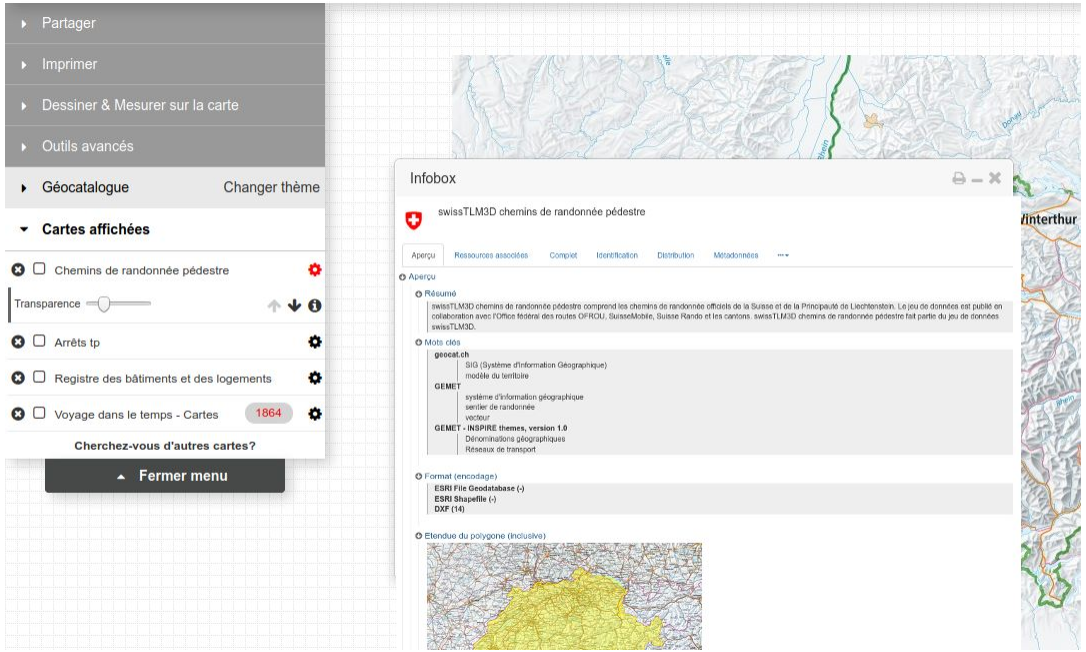
Embeddable “mini-apps” (2)

- Some examples:
  - Providing a simple search interface (one text input, some results)
  - Showing a full metadata record
  - Basic map viewer showing either metadata extent or WMS/WFS data



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Embeddable “mini-apps” (3)

- Summary:
  - Very simple to use, accessible to non-developers
  - Opens up new ways to access the metadata catalog in various contexts
  - Can blend in a surrounding theme with dynamic styling
  - Will require extra maintenance for those specifically

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Full-blown apps (1)

- A small number of feature-complete apps can be built using smart components
- Could be similar to the current UI logic, although…
- Offering more specialized apps might make sense, e.g:
  - Metadata search *without* map viewer
  - Metadata search *with* map viewer
  - Metadata authoring tool
- Specialized means lighter and better suited for their intended usage

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Full-blown apps (2)

- Such apps could be deployed as stand-alone projects (e.g. docker image)
- Also possible to embed them in the Java webapp to allow hassle-free deployment (same as the current system)

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Full-blown apps (3)

- Summary:
  - Similar experience to the existing GeoNetwork UI
  - Could be deployed individually or embedded in the Java webapp
  - Addresses broader use cases, gives access to the catalog in a more traditional way

3. Starting point

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June 1st/2nd Codesprint (1)

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June 1st/2nd Codesprint (1)

- This Codesprint was focused on laying down the foundations for a new GeoNetwork frontend

- Goals were:
  - Make motivated choices for the technological components
  - Set up a skeleton of the project structure
  - Build a basic POC showing some of the expected benefits
- See: https://github.com/geonetwork/core-geonetwork/wiki/GeoNetwork-client-app-building-blocks-codesprint-1st-and-2nd-June-2020

3. Starting point

June 1st/2nd Codesprint (2)

- The project can be found at https://github.com/geonetwork/geonetwork-ui
- Contains:
  - A few smart components talking to each other: search text input, search results, sort by button…
  - A stand alone app using these components
  - An embeddable web component using these as well
  - Automated code checking using Github Actions
  - A “story book” to review individual presentational components

3. Starting point

June 1st/2nd Codesprint (3)

- A few priorities emerged:
  - Separation of concerns: components dedicated either to presentation or logic
  - Low compiled file size (= faster loading)
  - Straightforward build system
  - Dynamic theming
  - Ability to produce web components
  - Code quality: type-based language, code formatting, automated tests, guidelines

3. Starting point

What next? (1)

- GN community (you!) will drive the priorities and help establish the road map
- Possible topics:
  - Search components (facets, sorting, advanced search…)
  - Metadata record formatter
  - Permalink management
  - Data downloading
  - Map viewer
  - Pre-rendered pages / SEO
  - Other?

3. Starting point

What next? (2)

- Embeddable mini-apps can be released along the way, as more smart components become available
- Keep maintaining the existing GN4 UI, while avoiding investing in it too much
- Admin UI modules will not benefit from a complete rewrite as much; should be lower priority
- Depending on backend architecture changes, separate UI apps could be made for catalog administration, editing, harvesting records...

3. Starting point

...and what about metadata editing?

- The current editor is frustrating for a lot of people
- Metadata editing is a complex topic that spans both backend and frontend concerns
  → *Out of scope for this presentation*
- The new UI architecture would open up new options for a separate editor application, which...
  - Could use the future UI components to list records, subtemplates, services…
  - Could be integrated as a component as well, or inside a dedicated “mini-app”

4. Conclusion

4. Conclusion

- The current GeoNetwork UI is staying:
  - One-stop-shop mindset, easy install, customizable!
  - No additional development cost!

- New development efforts go to a separate UI project:
  - New features will not break, i.e. *no regressions!*
  - Future-proof architecture
  - Many more options to access the catalog and its features
  - Each € spent will be more profitable!

4. Conclusion

Any questions?