con terra

Developing Apps for tempo-spatial meteorological satellite data - using OGC Services

EUMETSAT ImageGallery

Key Concepts for better MapApps

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EUMETSAT – New ImageGallery - Overview

- New EUMETSAT Image Gallery webApp:
  - Under development in context of EO Portal
  - EUMETSAT data is visualized by OGC Web Map Services (WMS), including
    - On-the-fly Image generation for user-defined area
    - retaining native resolution, data values, georeferencing information
    - WMS 1.3.0 supporting horizontal and temporal Reference System (RS)
      - Important time support, e.g. moments (TIME=2000-08-03) or intervals
  - provision of OGC Web Services
  - Automatic updates of images

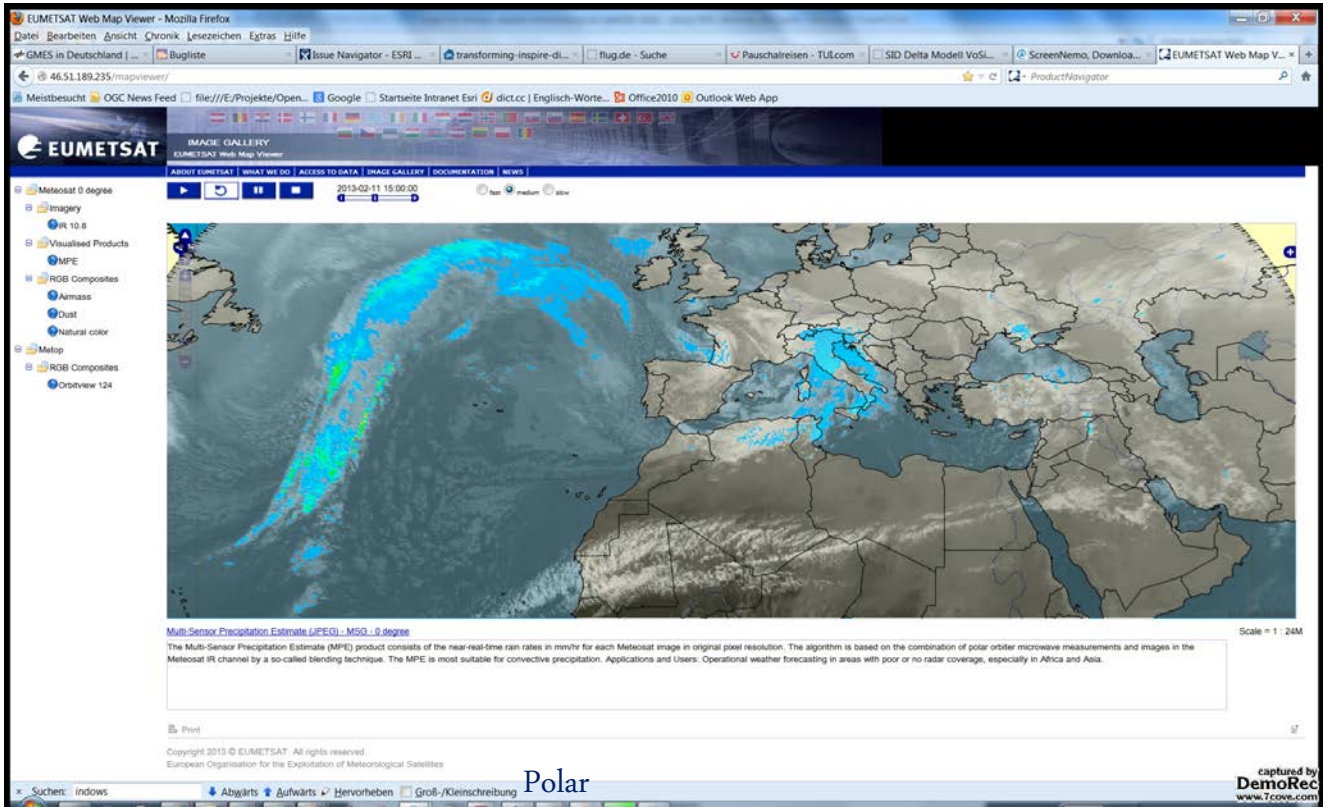
regular 3-hourly feed

Coverage (WCS)

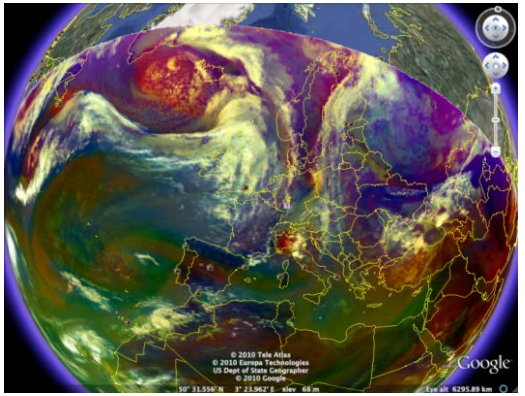
by

New ImageGallery - UserInterface

- Client shows global base data from a WMS
- User can select a product from a list
  - Product is overlayed on base map (default: most recent)
  - Available timerange for product is displayed
- User can:
  - Zoom in/out, pan, toggle layer visibility,
    switch background layer
  - Switch SRS (e.g. North Stereographic)
  - Add custom WMS
  - Select date and time for product
  - Show product abstract
  - Display product in GoogleEarth
- Animation support: first select animation settings

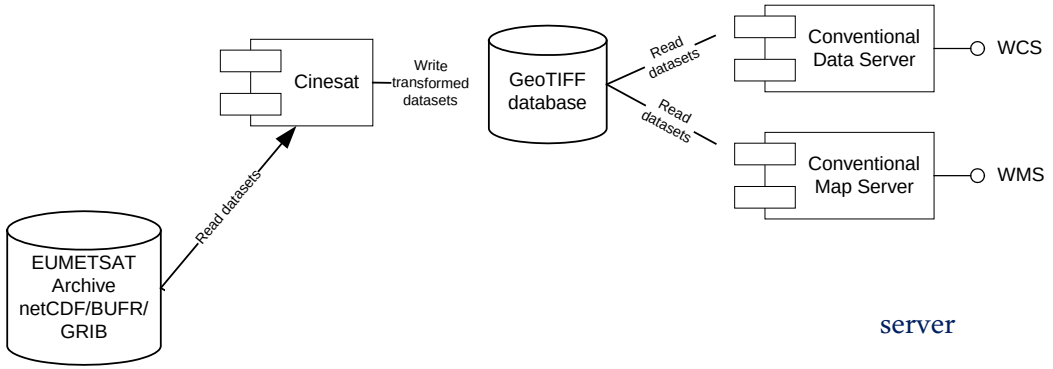


Polar

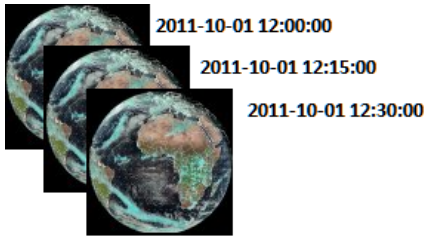


New ImageGallery Server – Data Organization

- meteorological products mainly stored in formats:
  - BUFR (edition 4)
  - GRIB (second edition)
  - Cinesat converts into GeoTIFF
    - Most COTS geodata and map server support GeoTIFF



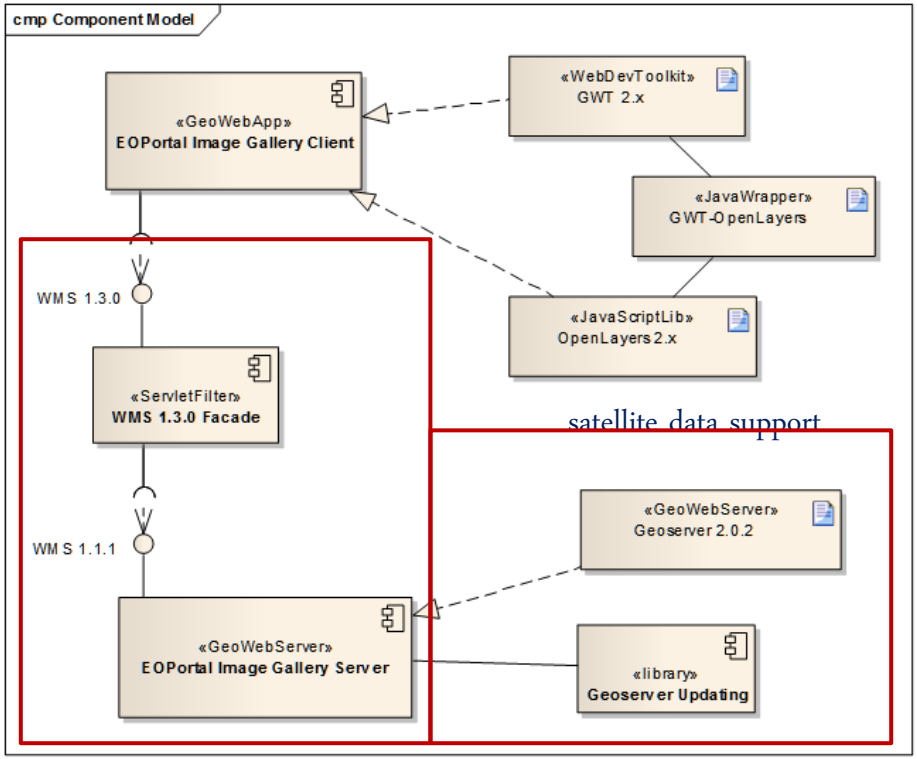
- For temporal dimension a specific physical and logical view must be prepared:
  - one physical dataset for each timestep used
    - Advantage: every image format can be used

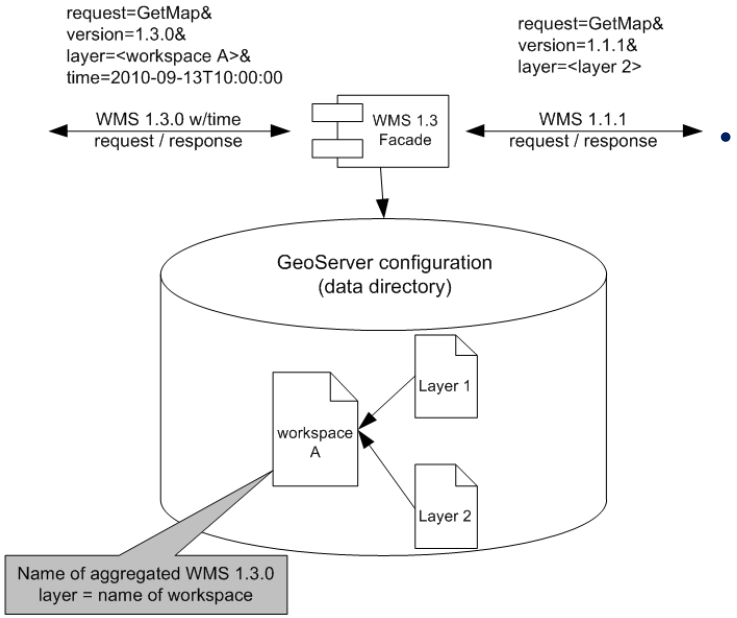


  - Web mapping requires logical organization of data as layers
    - here: one single layer represents the whole period
    - responsibility to request / return data for timeframe is on server & client-side
    - Time selection tbd by special parameter within requests
      - requires map service supporting WMS 1.3.0 with dimension parameters

New ImageGallery – Implementation Server

- based on Geoserver 2.2.4
  - open source, written in Java
  - supports WMS- and WCS-Interfaces
  - lots of input (incl GeoTIFF) and output formats
  - Important(!): RESTful interface for configuration
- ArcGIS considered: good option
  - Image Server extension for
  - WMS/WCS and RESTful config interface too
  - lots of client development tools based on JS
  - But: ArcGIS 10 last version with Solaris support

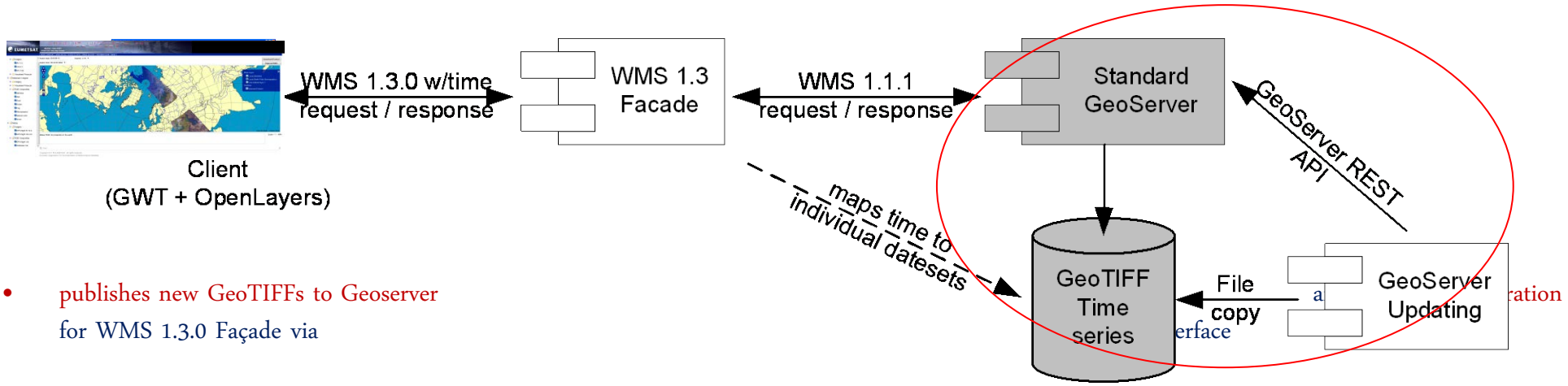




- For time dimension support a WMS 1.3.0 Façade (servlet filter) was developed
  - aggregates images representing points in time to virtual layer with time dimension (workspace)
  - transforms WMS 1.3.0 requests to WMS 1.1.1 requests
    - The latter reference image(s) corresponding to requested time)

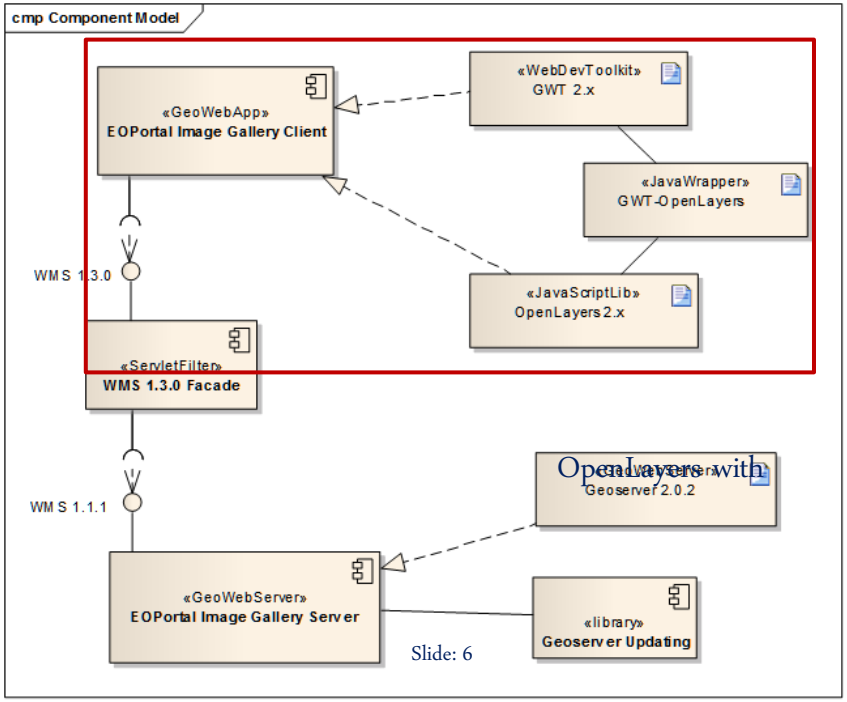
New ImageGallery – Implementation Server/Client

- for automatic updates of images, a "Publisher" (Geoserver Updating) was implemented



- publishes new GeoTIFFs to Geoserver
  for WMS 1.3.0 Façade via

- Image Gallery Client:
  - webApp accessing products via WMS 1.3.0
  - implemented with:
    - Google Web Toolkit (GWT) 2.x
    - JavaScriptAPI OpenLayers 2.8 for mapdisplay
    - GWT-OpenLayers (Java wrapper to integrate GWT)



OpenLayers with

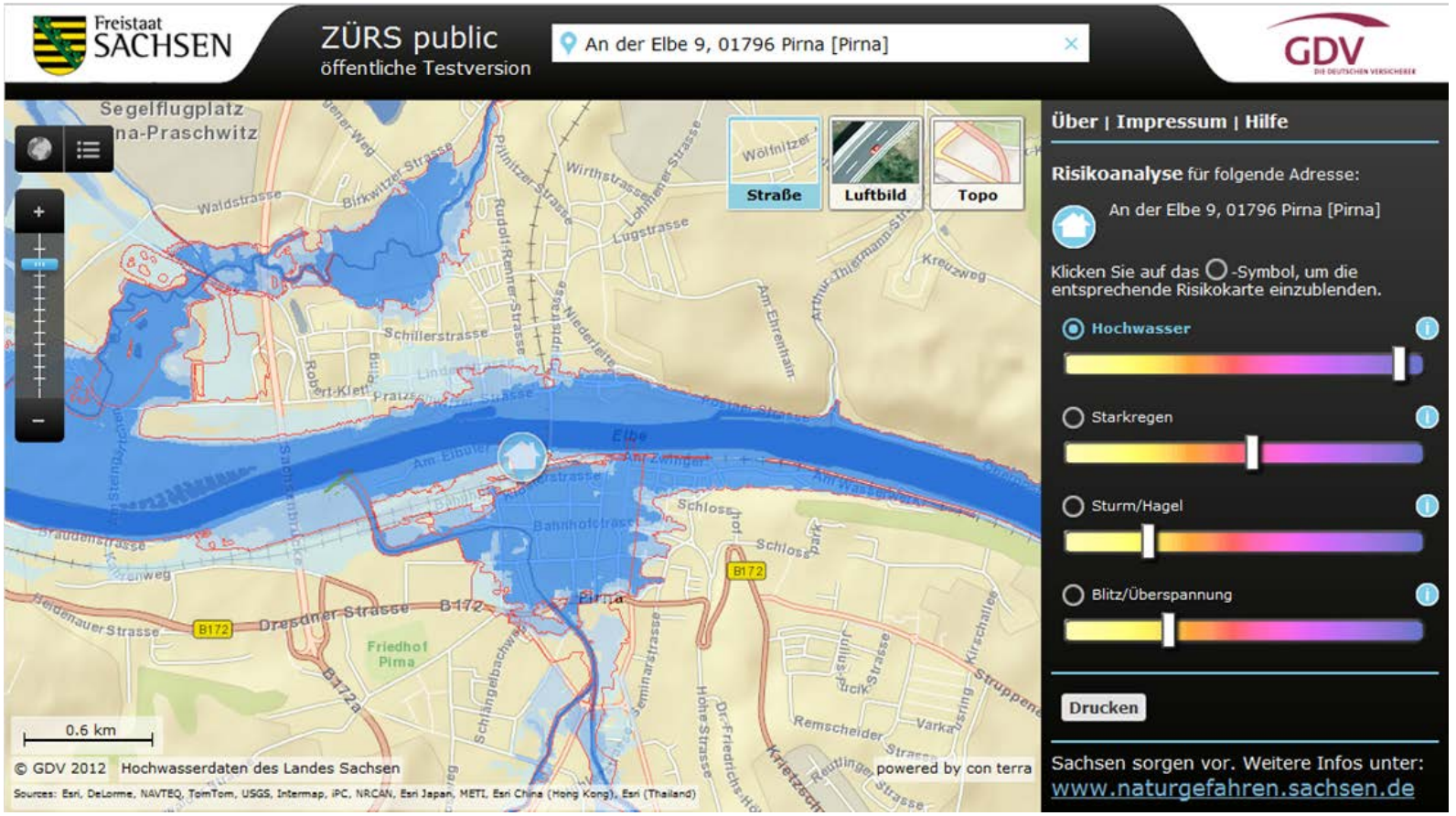
Improving map Apps

- Frequent shortcomings of map applications (applies partly for the ImageGallery too):
  - Focussed often on "geo-IT terminology": layers, CRS, opacity, ...
    - user often do not (want to) know anything about this
  - "Content overload"
    - often provide too much content in one single app in parallel
    - not focussed on specific content/solution
  - Device often not recognized:
    - Mobile solutions often don't consider device specific features
  - Design:
    - often driven by technologists and not by user interface designers
  - Known concepts of app controls not considered
    - Users prefer interface that is aligned with known concept
  - Too much development needed
    - For adaptations of existing apps or for the creation of new focussed apps there is much programming needed

- In the following a few key concepts will be shown which should be taken into account for better map apps

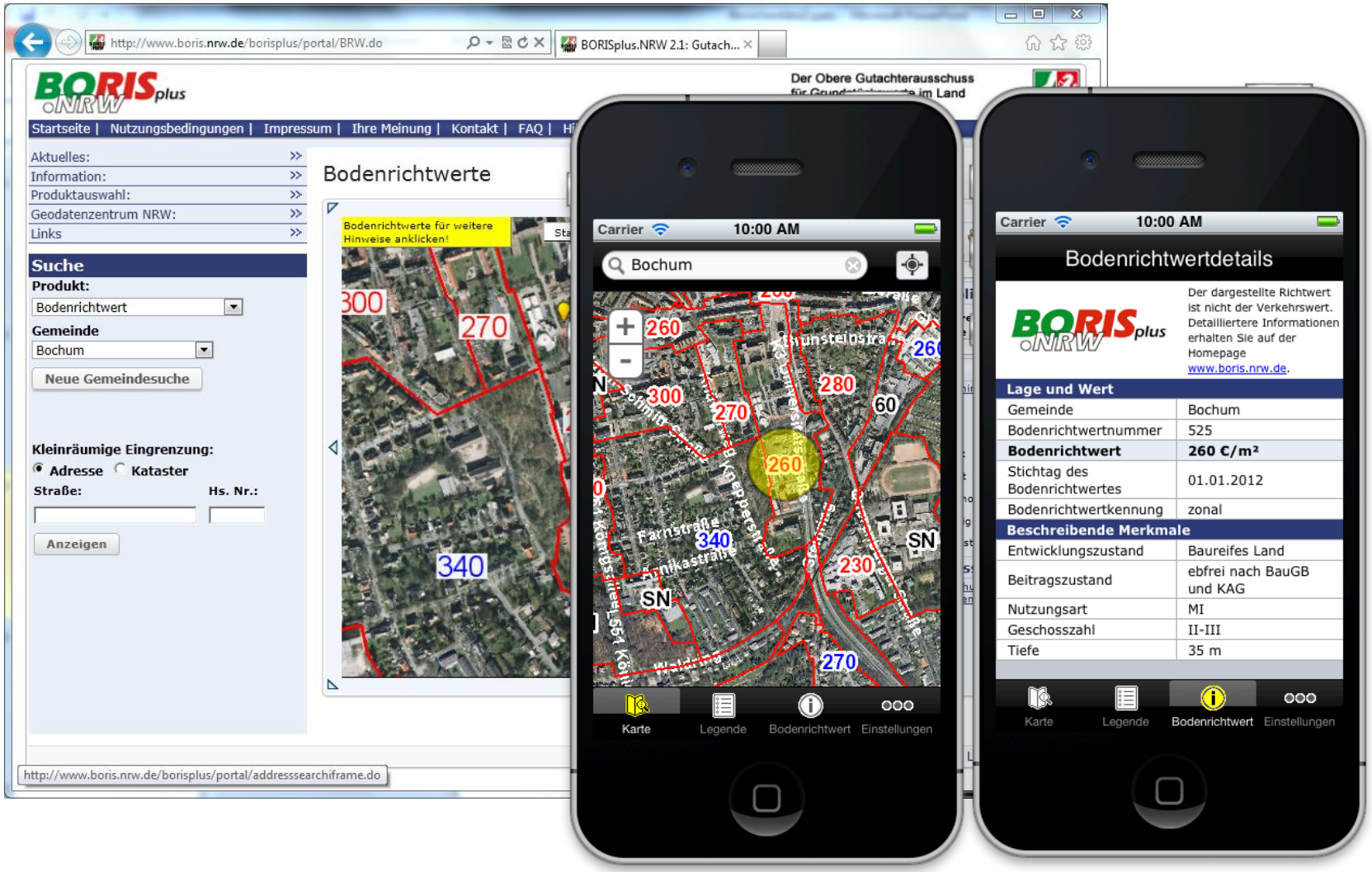
Key Concepts of Modern map applications

- Problem Fit: Simplified & Focussed
  - Risk analysis (flooding, heavy rain, storm) for German Bundesland Saxonia



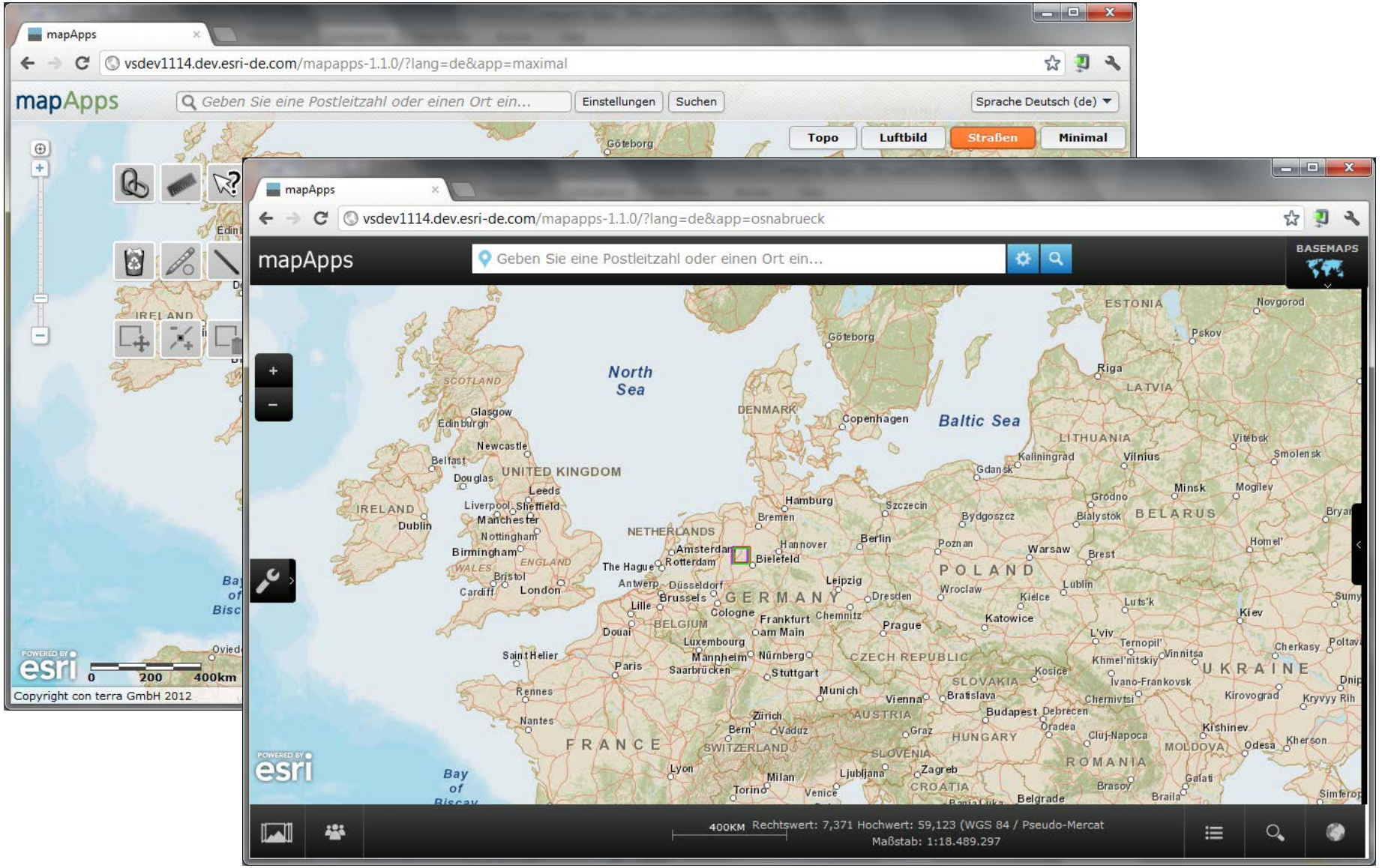
Key Concepts of Modern map applications

- Recognize the Context: Device
  - Ground values for German Bundesland NRW



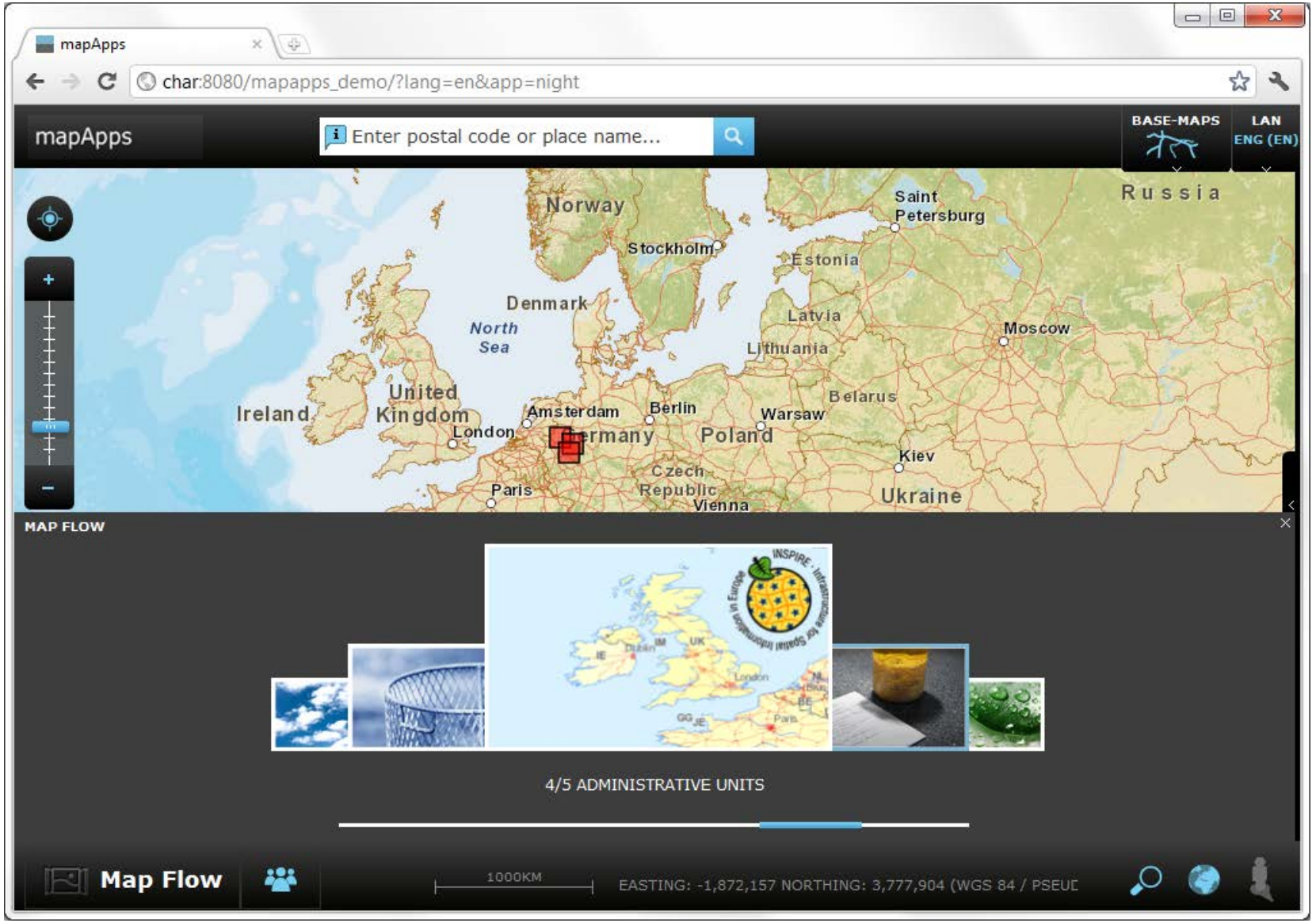
Key Concepts of Modern map applications

- Design (better composed, more clear)



Key Concepts of Modern map applications

- Known Concepts: mapFlow (like music selection/information in iPod)



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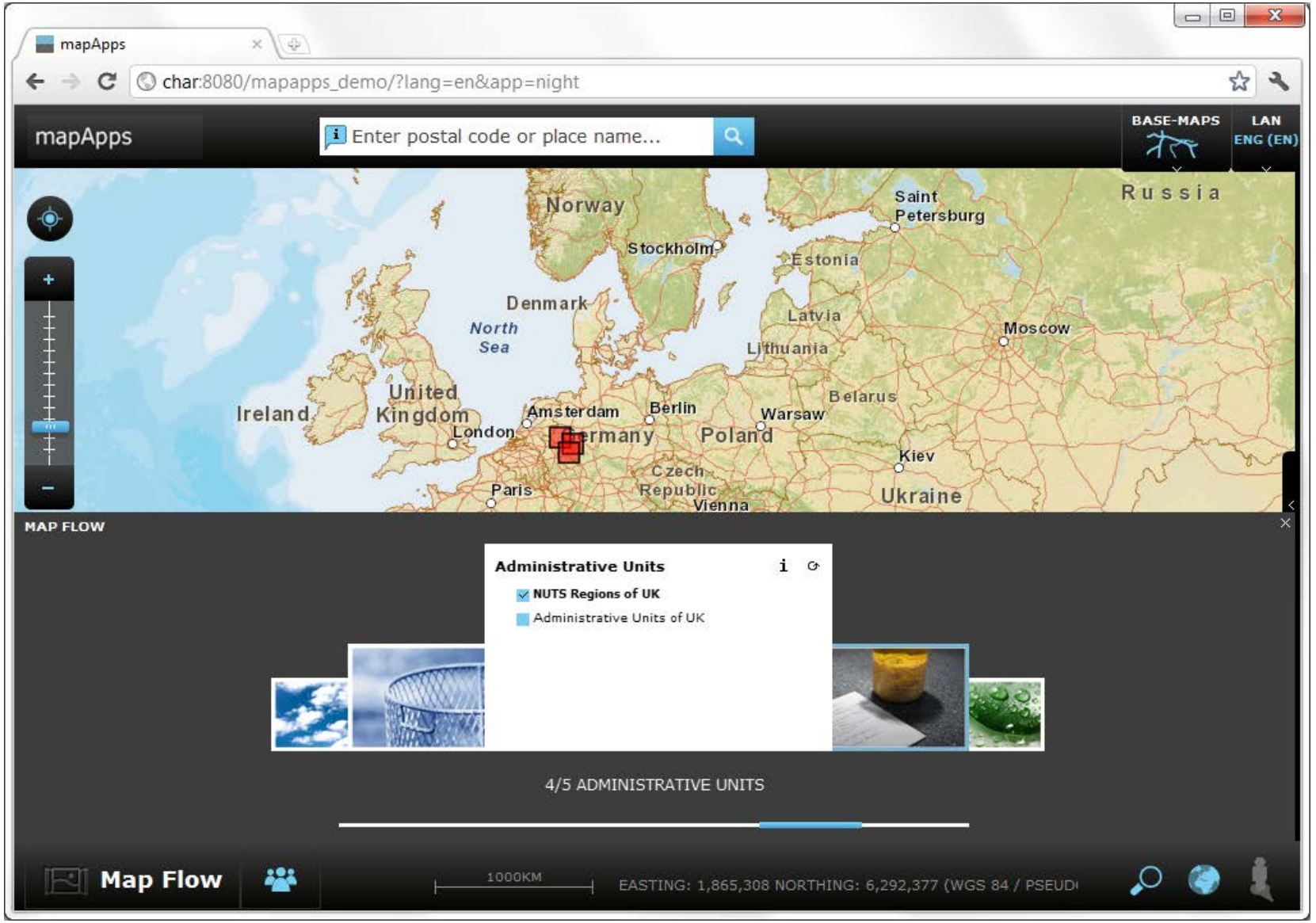

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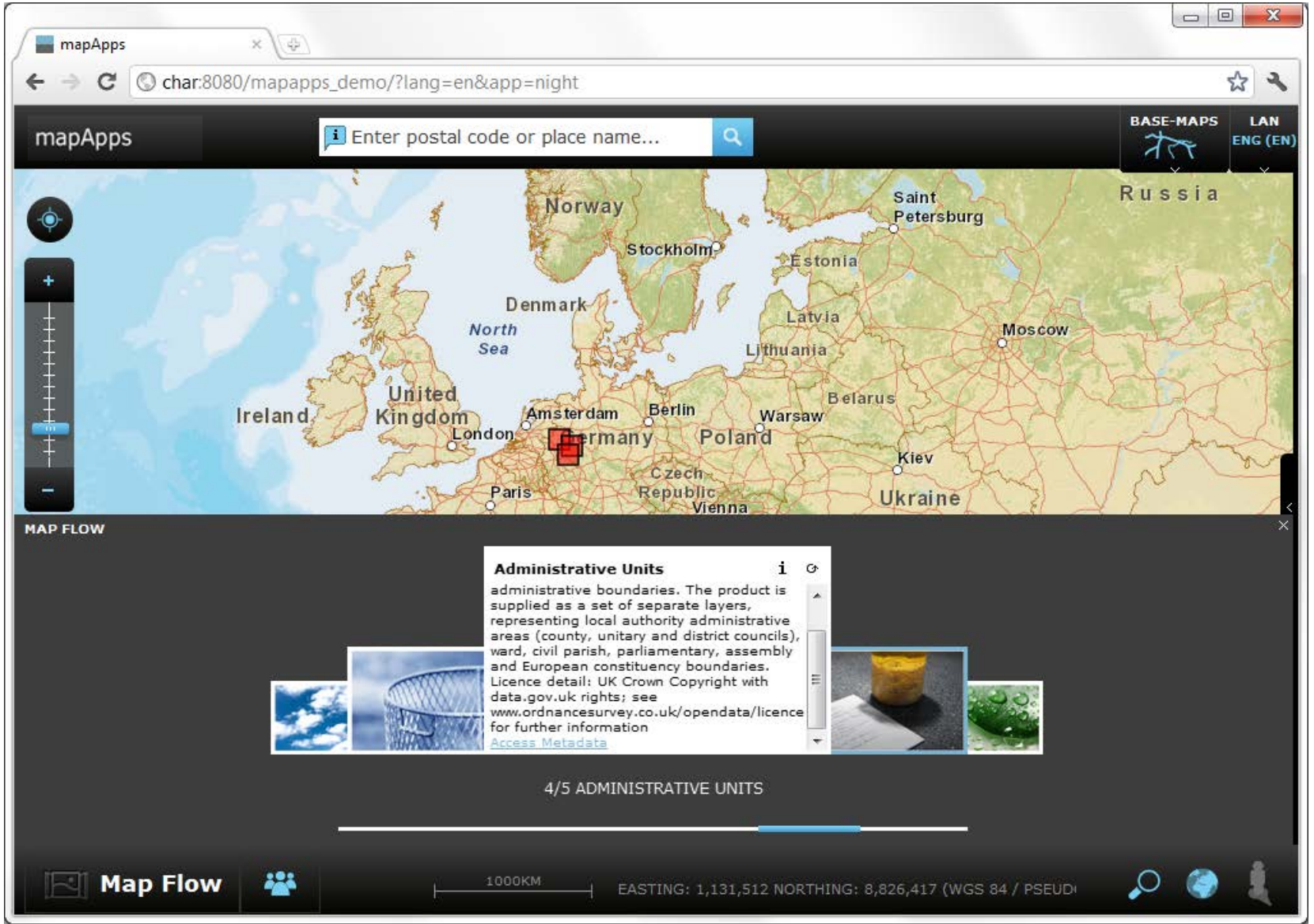

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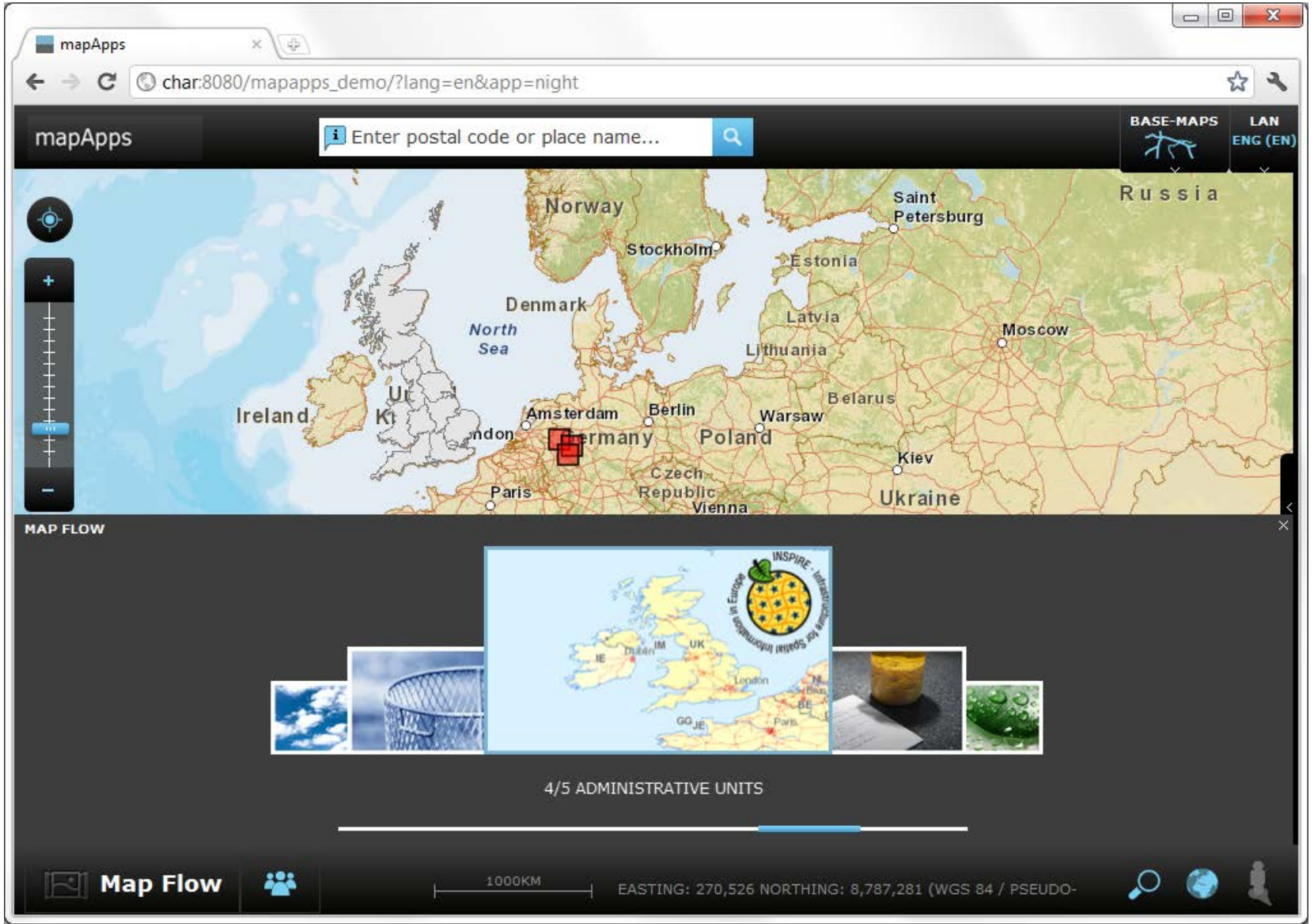
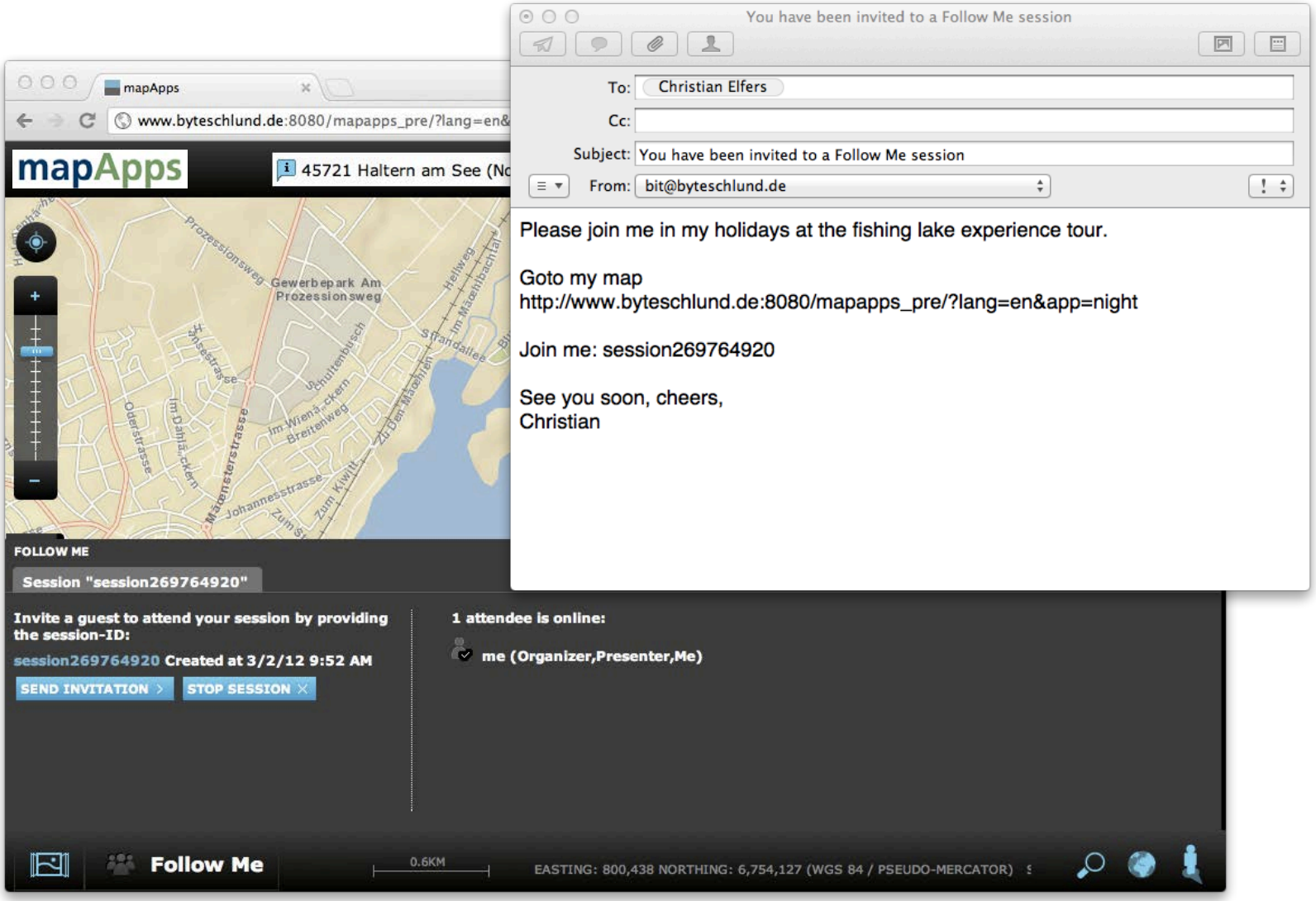


Key Concepts of Modern map applications

- Collaboration: FollowMe



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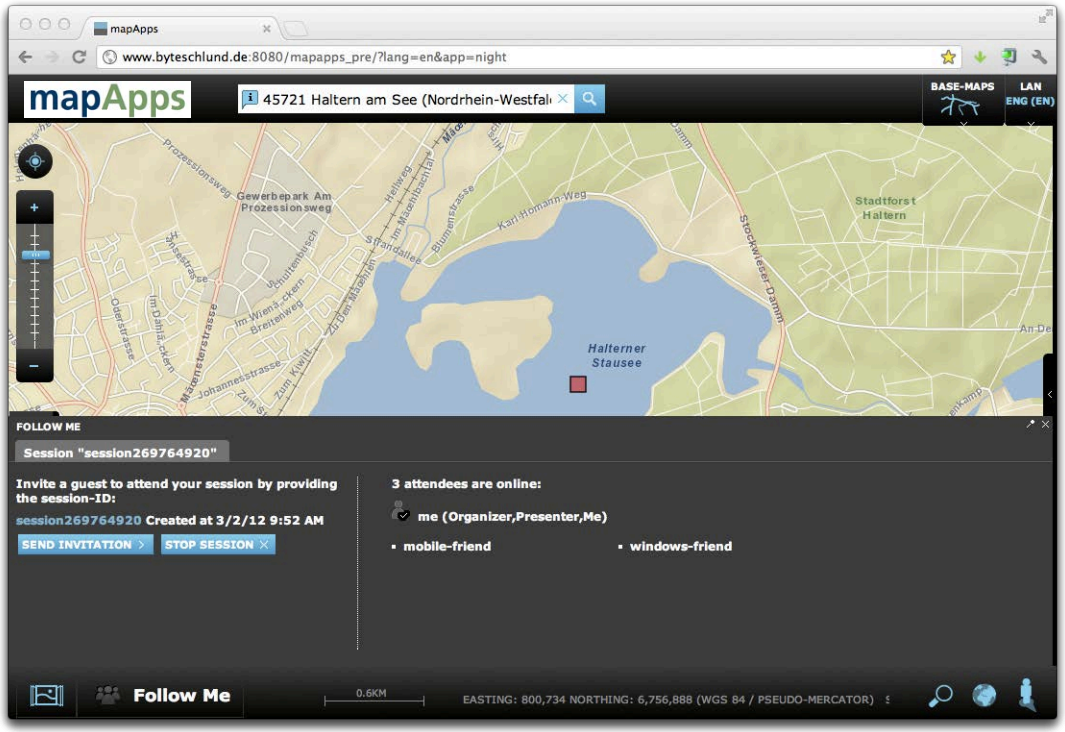

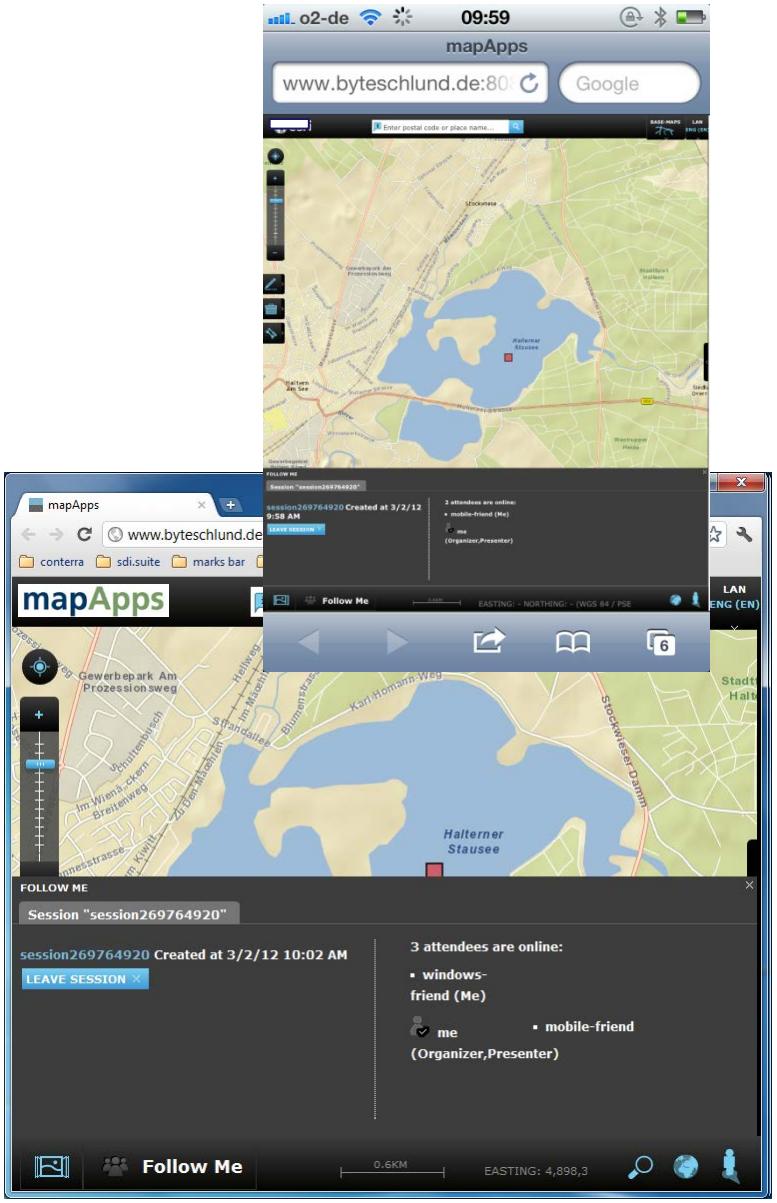

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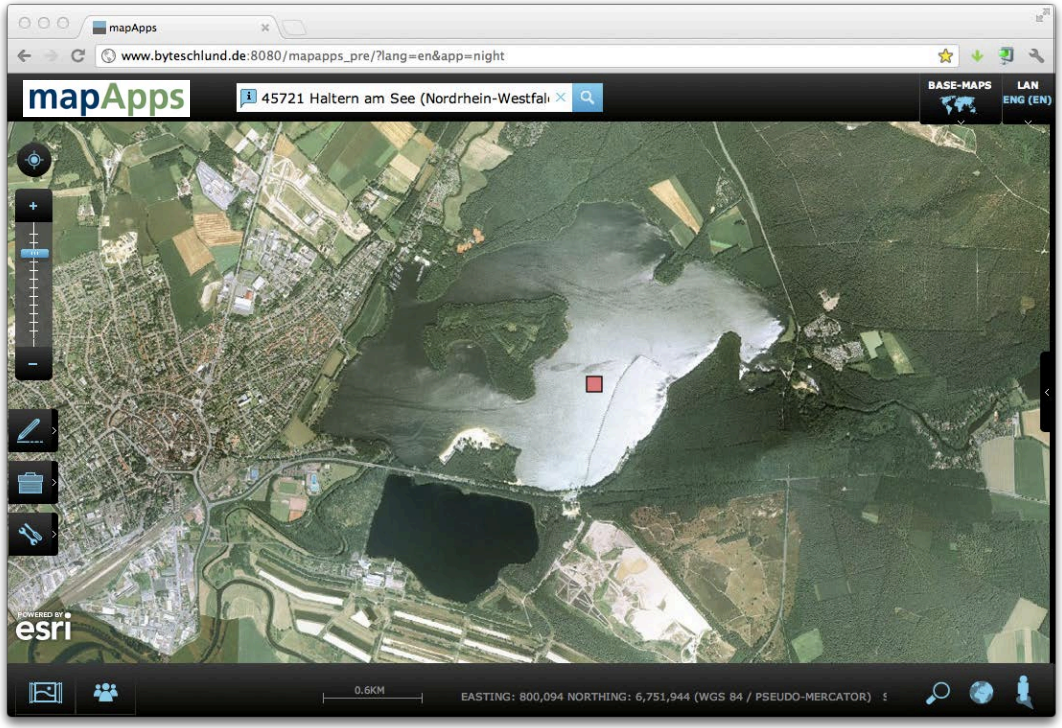

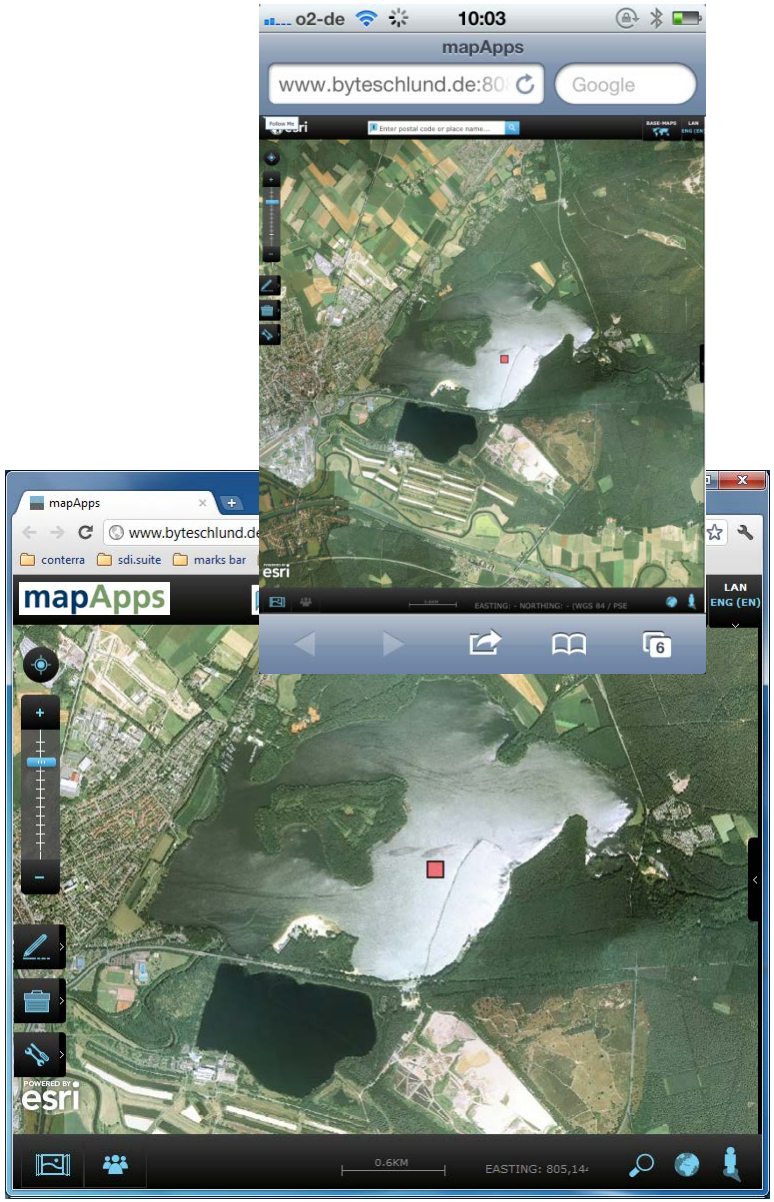

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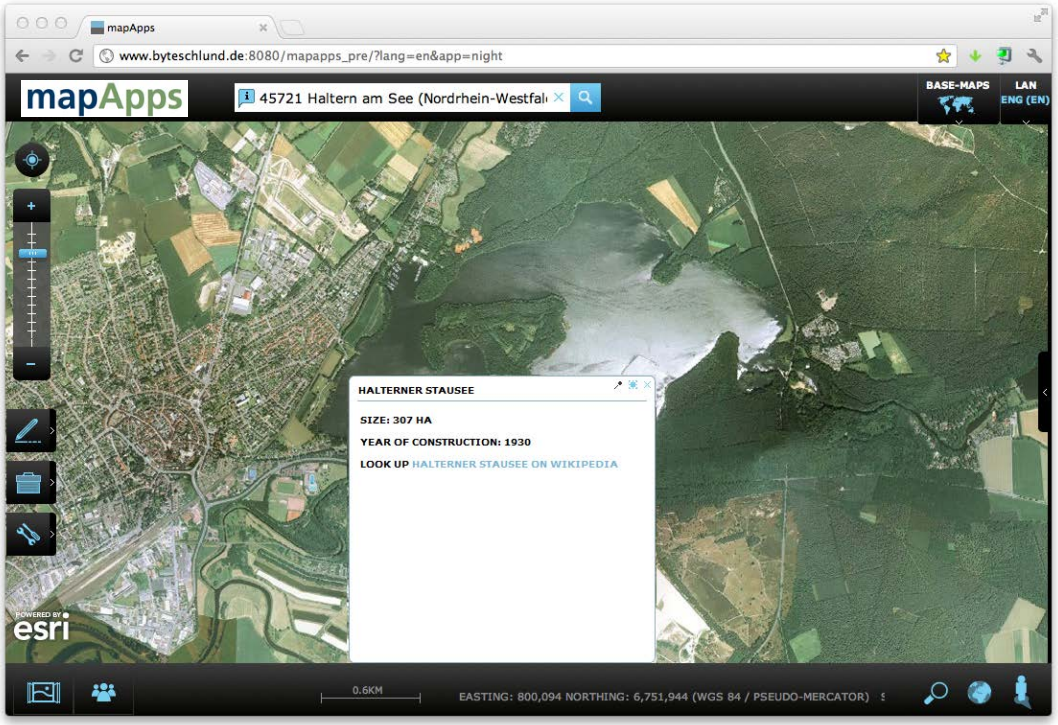
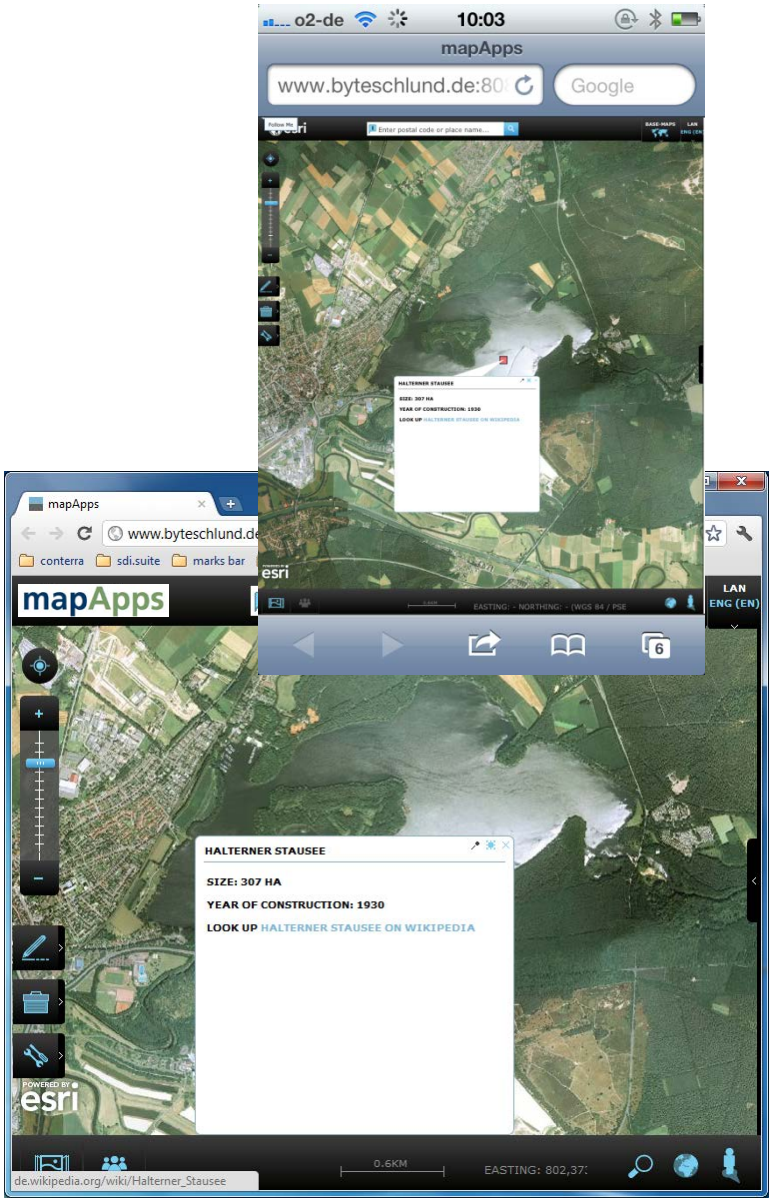
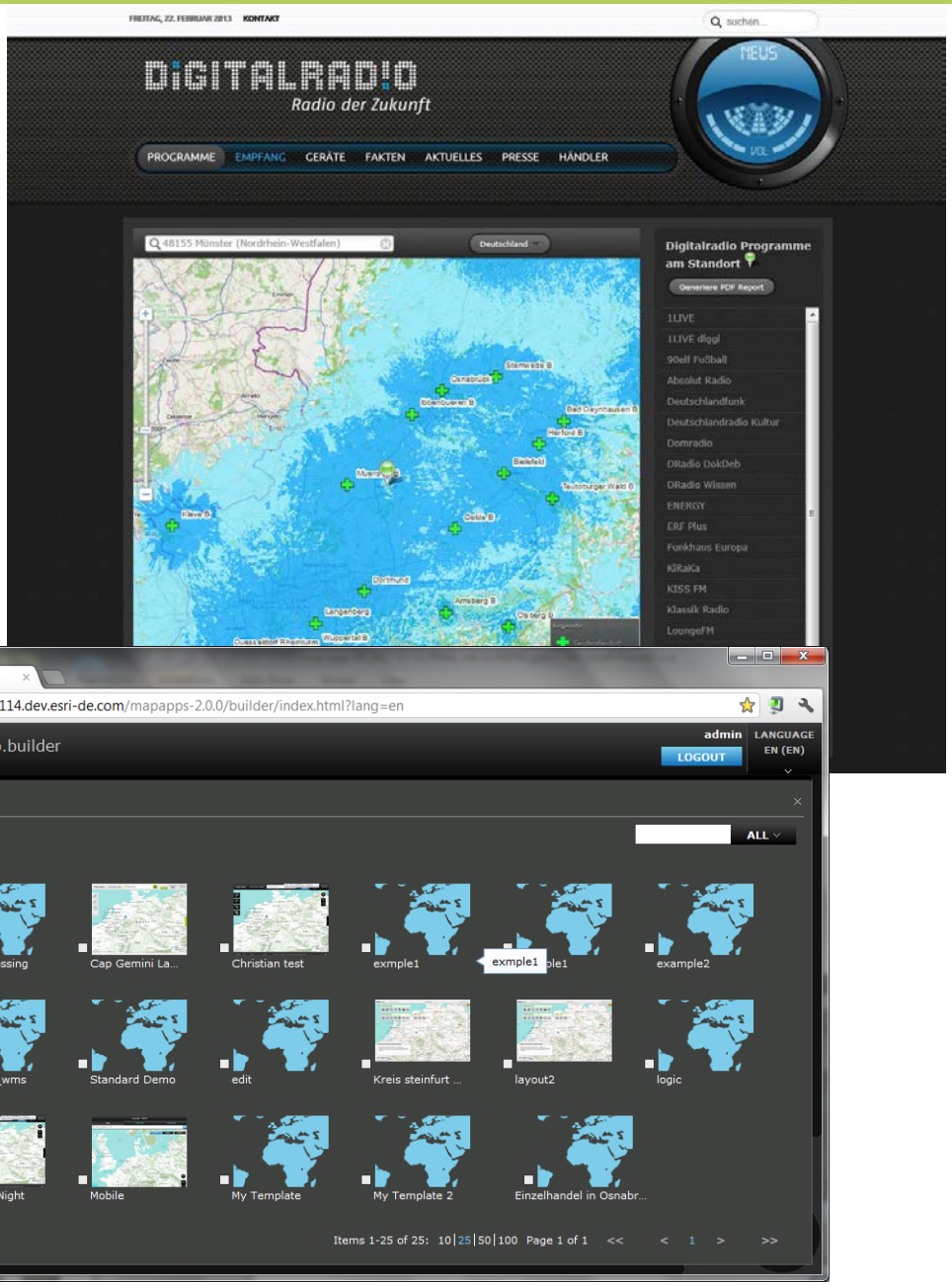




map.apps - building geospatial app's for web and mobile

- map.apps: software solution to build focussed geospatially enabled app's in an attractive, easy-to-use form
  - Provides Standard Architecture, Platform and Building Blocks
  - Cross-platform (web/mobile) and cross-device capable
  - Pure JavaScript/HTML(5) Client (no plug-ins)
  - Based on ArcGIS:
    - Esri JavaScript API, REST API, ArcGIS Server, ArcGIS Online
  - OSGi Framework for JavaScript
    - s. Javamagazin 3/2013

- app.Builder creates app`s based on App-Templates



www.conterra.de/mapapps