An Unlikely Road to Advanced Open Source 3D Mapping Technology

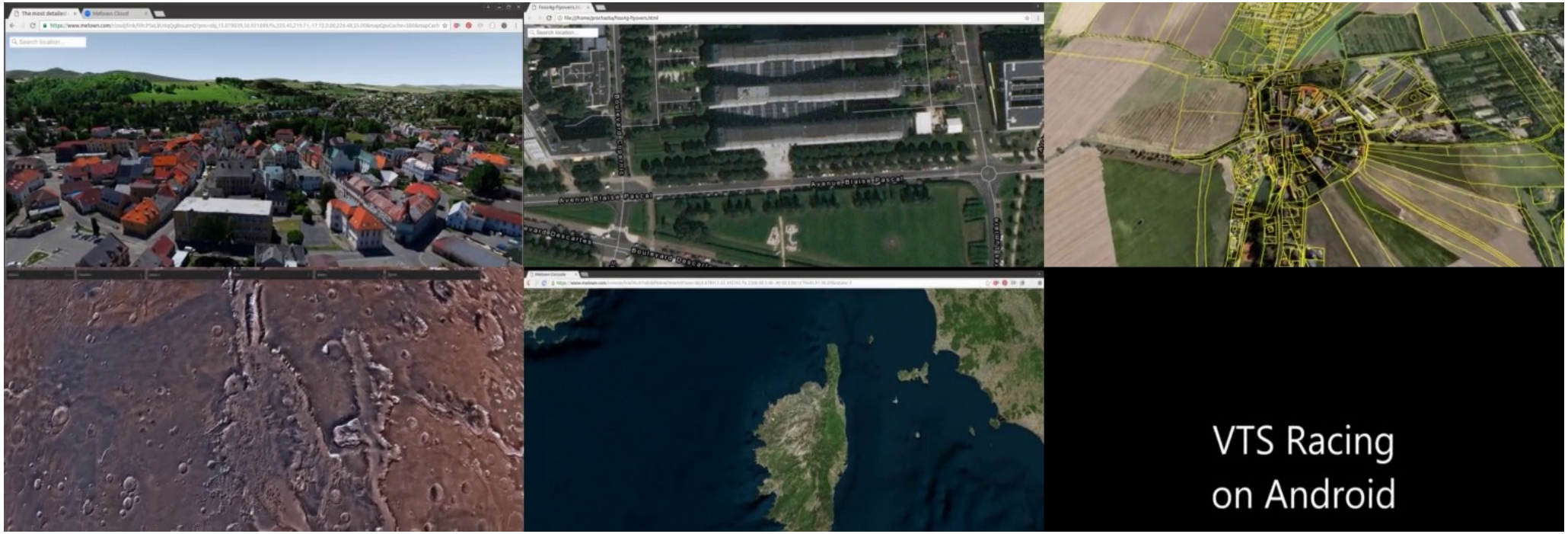
Ondřej Procházka, CEO Melown Technologies SE

VTS 3D Geospatial Software Stack

- An integrated platform for 3D map application development
- A “virtual world” streaming and rendering engine
- Designed and implemented at Melown Tech 2015-17
- Fully open source under BSD 2-clause license

Think Google Earth Enterprise, but on 2017 technology standards

What VTS can do: simple examples*)



*) Tutorials with sample data available at vtsdocs.melown.com/en/latest/tutorials

What this talk is about

I. How (and why) did VTS come to be?

II. Why did we make VTS Open Source?

Why VTS came to be?

“Who is crazy enough to compete with Google?”

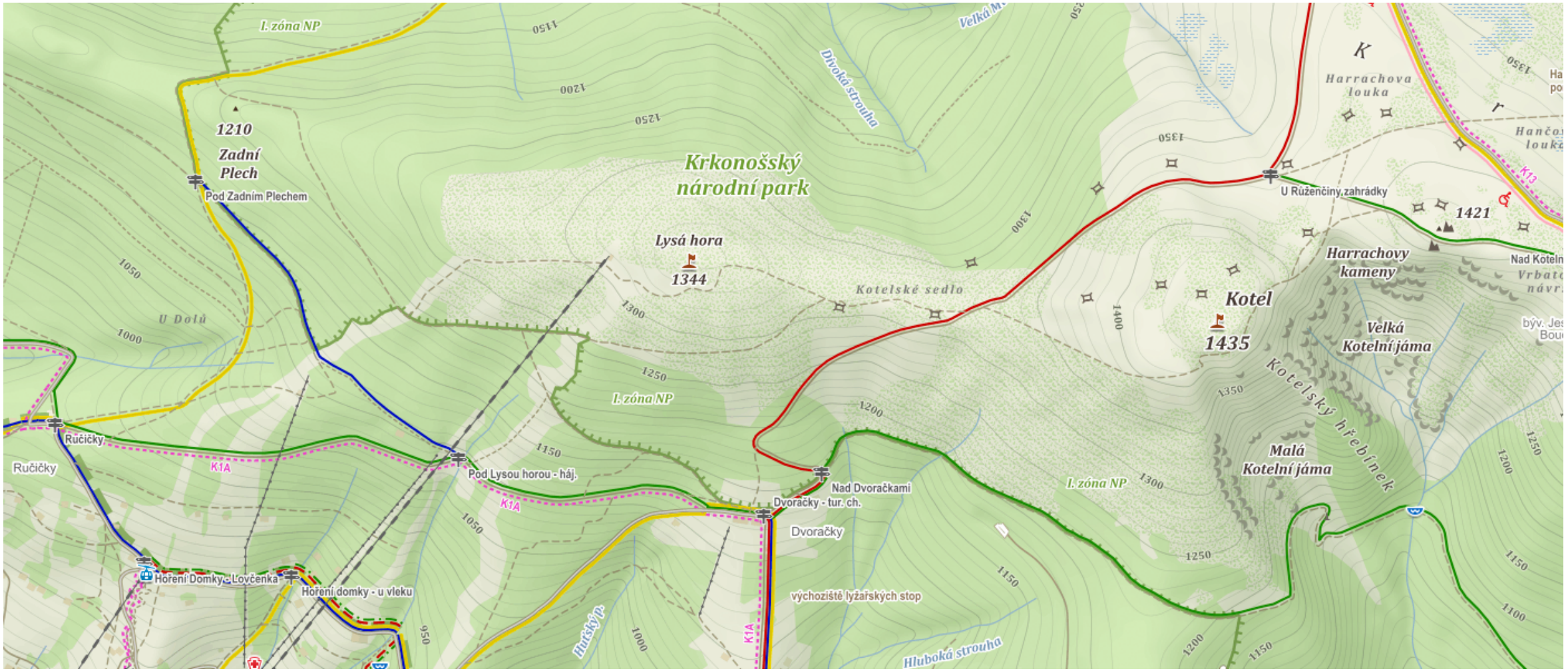
VTS background: Seznam.cz

- Created in 1996 as a categorized index of Czech language URLs
- Runs on in-house web search technology since 2004
- Country wide market penetration: 75% (June 2017)
- Internet advertising revenue share: 40% (estimated)
- Market value estimated at almost USD 1 billion... but the company is not for sale.

VTS background: Mapy.cz

- Czech language general purpose web mapping service
- launched by Seznam.cz in 2005 with
  - a country-wide VHR aerial imagery
  - hierarchical tiled maps with JavaScript based frontend
- market leader ever since (up to 750,000 users daily)
- great at “making GIS ordinary”

Mapy.cz outdoor maps



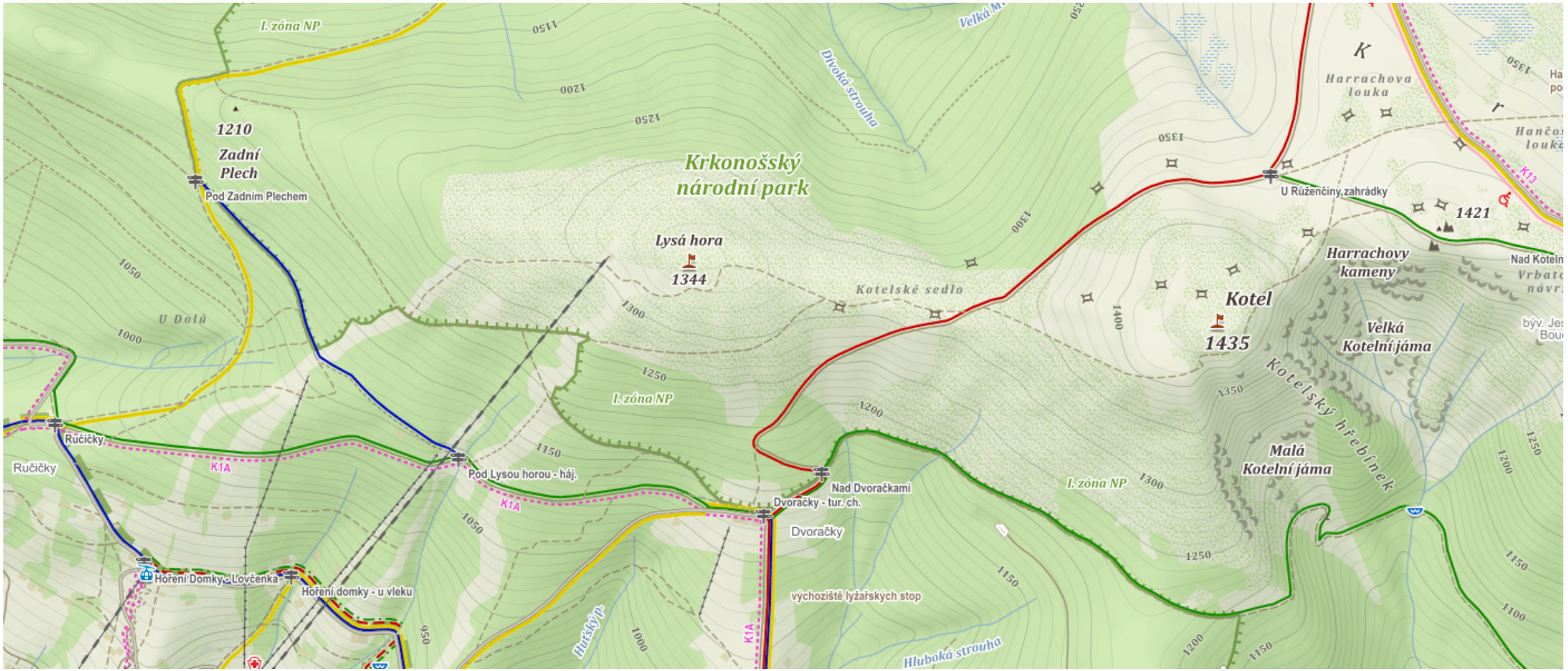
VTS background: enter Melown Technologies

- essentially, a Seznam.cz spin-off
- incorporated in 2011

Goals:

- to supplement aerial imagery on Mapy.cz with photorealistic 3D landscapes
- to take similar 3D mapping projects to the global market (if there is one)

Mapy.cz: topographic maps



Mapy.cz in 3D: the challenge

- Area to cover: 79,000 sqkm (= 32,000 sqm)
- Input data: 95,000 nadir images at 12.5 cm/px
- Input data: 313,000 oblique images at 10cm/px
- Continuous incremental updates (complete update cycle takes 2-3 years)
- Page load time constraints too keep up with Mapy.cz standards
- Massive peak traffic, bandwidth constraints, etc.

Mapy.cz in 3D: tackling the challenge

I. Automatic reconstruction of 3D urban and natural landscapes

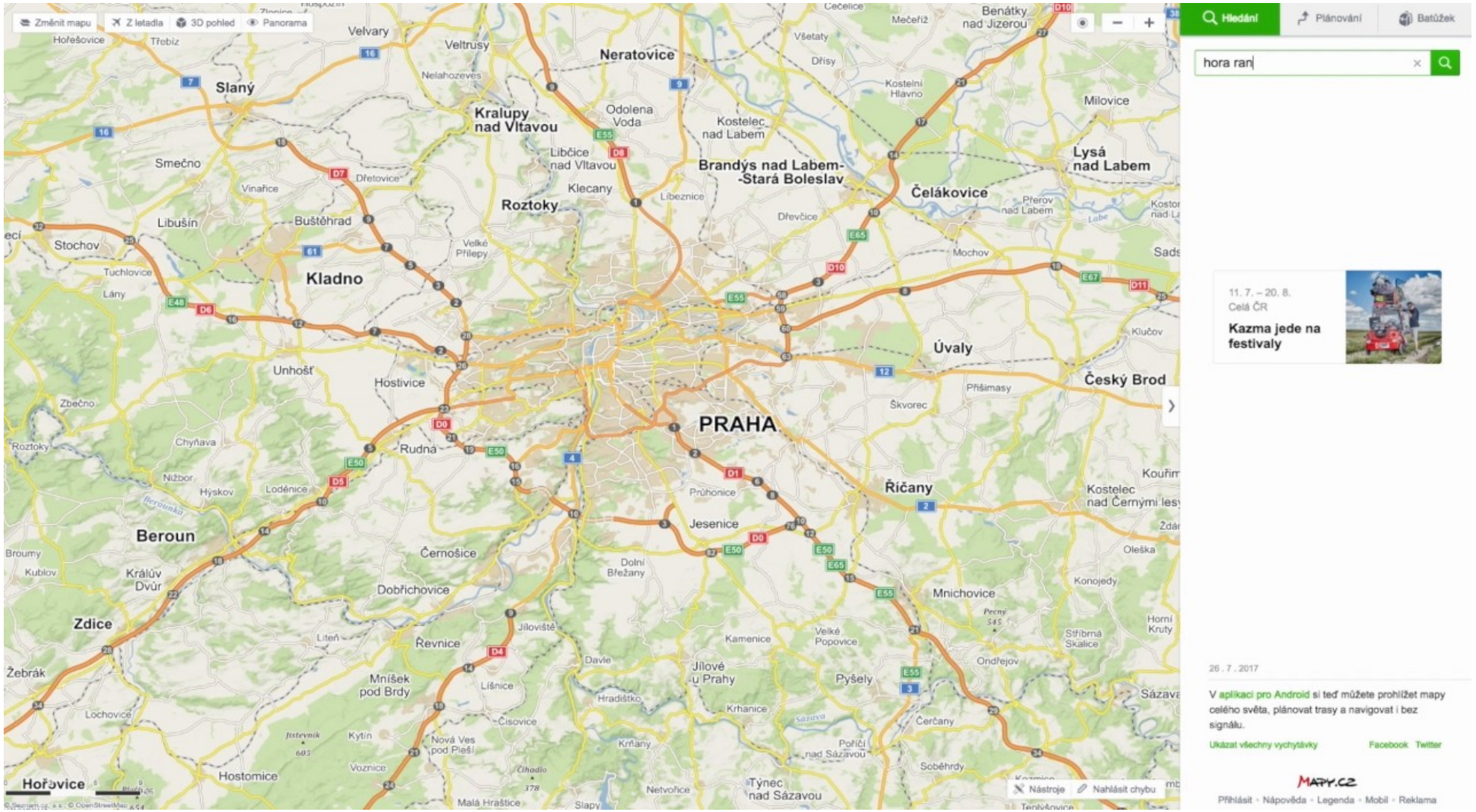
= Melown Photogrammetry

II. 3D landscape model encoding and fusion

III. Network streaming and browser-based interactive rendering

= VTS 3D Geospatial Software Stack

Mapy.cz in 3D – the result



Why is VTS Open Source?

Why distribute at all?

Global technology + Confinement to a local market = Sustainability problems

VTS is not an application, it is infrastructure

- Applications may survive even with a single user, but
- Infrastructure type of software needs a user base, or it faces decline
- Infrastructure software economy is an attention economy

The original plan...

- make vts-browser-js open source
- operate data fusion / server streaming components as freemium cloud-based service
- optionally distribute the backend as closed source, boxed software

… why we ditched it:

- data in the cloud is not an option for many people and organizations
- cloud UI integration of VTS features proved slow and diminished our focus
- freemium made our pricing uncomfortably complex
- boxed software distribution is tremendous overhead

Current VTS licensing

- BSD 2-clause, full stack
- Covers everything:
  - data fusion and management tools
  - server side streaming components
  - client side libraries

Does an OS license hurt our business? Hell, no.

- We can work with any kind of client and any kind of deployment scenario
- New features are immediately available (no cloud UI integration overhead)
- Transparent, simple pricing for our projects

Lessons learned (takeaways)

- Choice of software license is all about business, not ideology
- Your customer does not care about your license, unless it gets in his way

Sources of VTS information

melown.com/vts

github.com/Melown

Getting involved in VTS development

contact: community@melown.com

or fork us on GitHub ;-)