



# KPublicTransport

Real-time transport data in KDE Itinerary

Akademy 2019

Volker Krause

[vkrause@kde.org](mailto:vkrause@kde.org)  
[@VolkerKrause](https://twitter.com/VolkerKrause)



- Digital travel assistant, with privacy
- Last year:
  - Personal booking data (via KItinerary extractor)
  - Static data (via Wikidata)
  - Missing: Transport schedules, real-time traffic data



# OpenTransport community

- Open Data by transport operators
  - Base schedule (often GTFS)
  - Real-time data (often GTFS Realtime)
- Server-side Free Software for using this
  - Navitia
  - OpenTripPlanner



Navitia



navitia.io

- Aggregates GTFS feeds and offers API for:
  - Multi-modal journey computation
  - Departures and line/stop schedules
  - Location searches
- Supports real-time data and disruptions
- AGPL-3.0, C++/Python
- Hundreds of data feeds in hosted version



Navitia



navitia.io





- QNAM-like query interface for locations, departures and journeys
- Supporting multiple backends
- Location-based backend selection
- Merging results from multiple backends

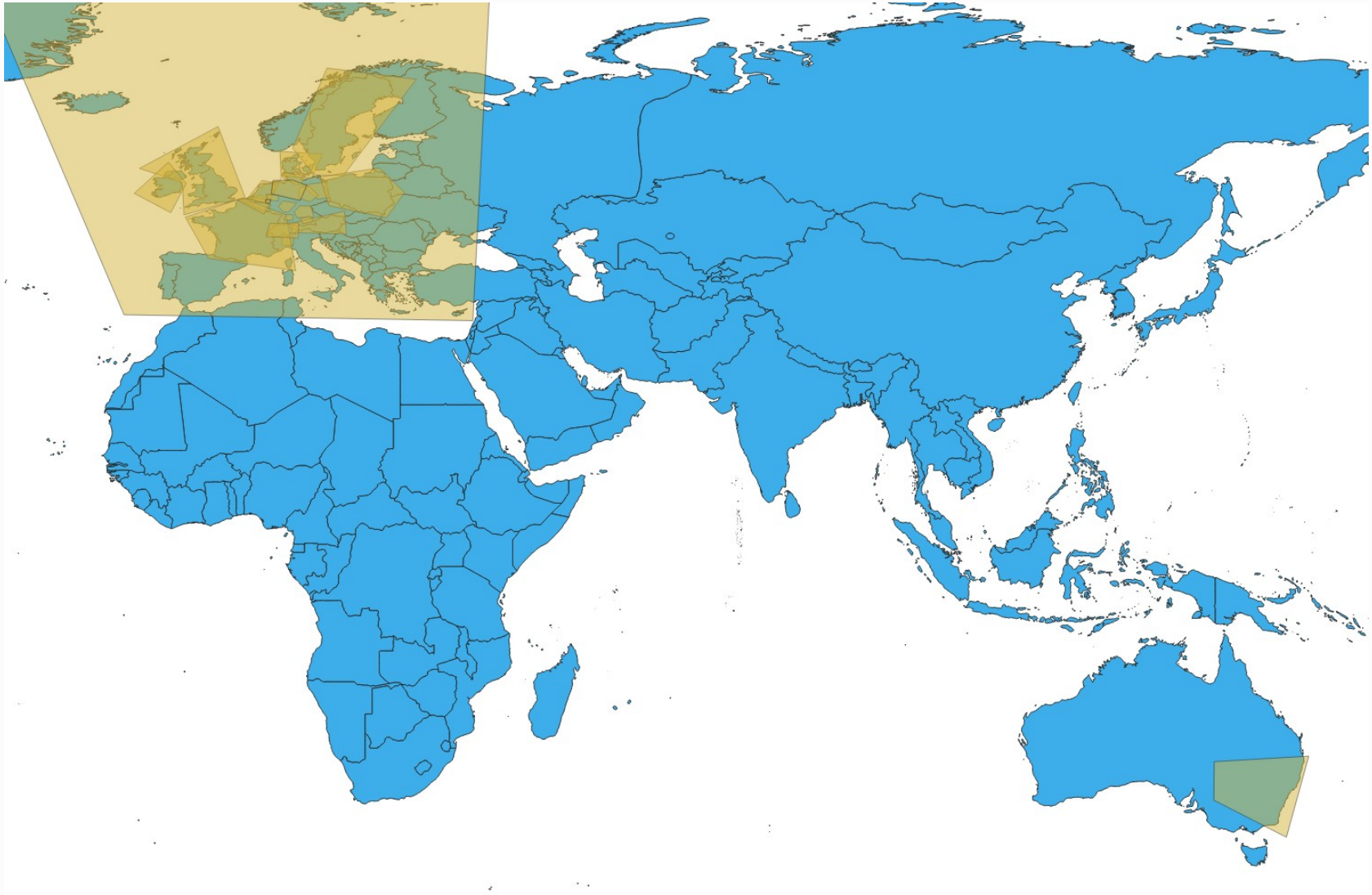


# Backends

- Navitia
- Proprietary systems, some with open APIs
- Still to do: OpenTripPlanner
- Challenges:
  - Result merging
  - Fuzzy location search results



# Backends







## Result Aggregation

- There is no universal standard for identifying locations, trips, etc (unlike with air travel)
- Geo coordinates don't uniquely identify a transport stop, but they are a big help
- Missing locality context (eg. "Airport")
- Line vs. trip identification for trains
- Spelling variants, abbreviations, etc.



## Privacy

- Online access unavoidable
- Limited room for caching
- But: We control what is being sent
- Not all proprietary backends support TLS (!)
- Manual backend selection still to be done



## License & Attribution

- Open Data just like Free Software comes with license constraints attached
- Varies from provider to provider
- KPublicTransport also aggregates attribution information from its backends



## What else is there?

- KPublicTransport only supports a minimal set of available features/data so far
- Possibly interesting for different use-cases:
  - Detailed route paths, various routing properties
  - Station schedules, global disruption information
  - Train load
  - Station accessibility, lift status, etc
  - Fares, CO2 usage per journey



## Deja-vu from 10 years ago?

- KDE4 era public transport Plasmoid
  - Unfortunately discontinued
- Web scraping
  - Rise of mobile apps improved vendor APIs
- Offline GTFS processing
  - Not feasible on mobile, specifically with GTFS Realtime



# KDE Itinerary Integration

## Departure

Time: 13.01.19 14:52 +0

Station: Düsseldorf Hbf



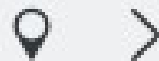
Platform: 17 (was: 18)

---

## Arrival

Arrival time: 13.01.19 19:27 +27

Station: Berlin Hbf



Platform: 11 A - D



# KDE Itinerary Integration


☰ < > Alternative Connections ^

12:05 2:51

🚗 0 changes


12:30 3:21

12:30 +0 S+U Berlin Hauptbahnhof (tief) 2

 ICE 509 (3:21)

15:51 +0 Nürnberg, Hauptbahnhof 9

*Komfort Check-in möglich <http://bahn.de/komfortcheckin>*  
*Bicycles conveyed - subject to reservation*  
*Number of bicycles conveyed limited*  
*Bordrestaurant*  
*vehicle-mounted accessaid*  
*VBB-Verbundfahrausweise ganz oder teilweise ungültig*  
*Bicycle conveyance*

 Save

13:37 3:15









🚗 0 changes

∨

Data providers: [Berlin, Germany](#), [Nuremberg](#), [openstreetmap](#), © [navitia.io](#)



# KDE Itinerary Integration

☰ < > Departures	
11:40 S+U Berlin Hauptbahnhof	
 Tramway M5	
To: Berlin, Zingster Str.	
11:40 S+U Berlin Hauptbahnhof	
 Bus M10	
To: Berlin, Lüneburger Str.	
11:40 +0 Berlin Hauptbahnhof (S+U), Berlin	
 STR M5	
To: Hohenschönhausen, Zingster Str.	
11:40 +4 Berlin Hauptbahnhof (S+U), Berlin	
 STR M10	
To: Moabit, Lüneburger Str.	
11:40 +0 Berlin Hbf (S-Bahn)	16
 S 3	
To: Berlin-Spandau (S)	
11:40 +0 Berlin Hbf (tief)	7
 ICE 602	
To: Hamburg-Altona	
11:40 S+U Berlin Hauptbahnhof	
 Train S9	
To: S Spandau Bhf (Berlin)	
11:41 +2 S+U Berlin Hauptbahnhof	13
 Train RE 3172	
To: Magdeburg, Hauptbahnhof	





# KTrip

### Start Journey

Search

From:

To:

Departure date:

Departure time:

### Connections

Earlier

08:01 - 15:50 (7:49)	
10:20 - 09:12 (22:52)	3 changes
11:54 - 09:12 (21:18)	2 changes
08:01 - 15:50 (7:49) <b>+1</b>	
10:07 - 09:12 (23:05)	3 changes
10:20 - 09:12 (22:52)	3 changes
11:50 - 09:12 (21:22)	2 changes
11:54 - 09:12 (21:18)	2 changes
08:01 - 15:50 (7:49) <b>+1</b>	
08:01 - 15:50 (7:49)	
09:50 - 18:50 (9:00)	2 changes
09:50 - 18:35 (8:45)	5 changes
10:07 - 09:12 (23:05)	3 changes
10:07 - 18:50 (8:43)	3 changes
<b>11:50 - 20:32 (8:42)</b>	<b>4 changes</b>
11:50 - 09:12 (21:22)	2 changes
12:50 - 20:50 (8:00)	2 changes
12:50 - 21:37 (8:47)	1 change
13:58 - 21:37 (7:39)	2 changes

Later

### Details

<b>IC 1993</b>	
10:07 Frankfurt (Main) Hauptbahnhof	19
11:57 <b>11:59</b> Stuttgart Hauptbahnhof	5
<b>IC 2263</b>	
12:54 Stuttgart Hauptbahnhof	14
15:12 München Hbf	16
<b>EC 83</b>	
15:34 München Hbf	11
20:56 Verona Porta Nuova	
<b>NJ</b>	
07:00 Verona Porta Nuova	
09:12 Milano Centrale	



## Conclusion

- Practically useful and freely available public transport data exists
- We now have infrastructure to access that, even if only tapping a fraction of the data yet
- Ideas:
  - Mycroft integration
  - The daily commute counter-part to KDE Itinerary

Questions?



# References

- OpenTransport Community
  - Navitia.io: <https://www.navitia.io/>
  - OpenTripPlanner: <https://www.opentripplanner.org/>
  - PTE: <https://github.com/schildbach/public-transport-enabler>
  - Transportr: <https://transportr.app/>
- Data Formats
  - GTFS: <https://developers.google.com/transit/>
  - GTFS Realtime:  
<https://developers.google.com/transit/gtfs-realtime/>