An Agent Based Travel Assistant for the Dutch Railway Company

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Outline

- Problem definition
- Distributed agent based communication system
- Design of the Personal Intelligent Travel Assistant
- Experiments
- Conclusion

Artistic impression of seamless multimodal transport , using Personal Intelligent Transport Assistant

PITA provides info about Start and Arrival times of trains, busses, planes etc.

Pita is able to plan a multimodal route

Bulletin Board of time tables of trains

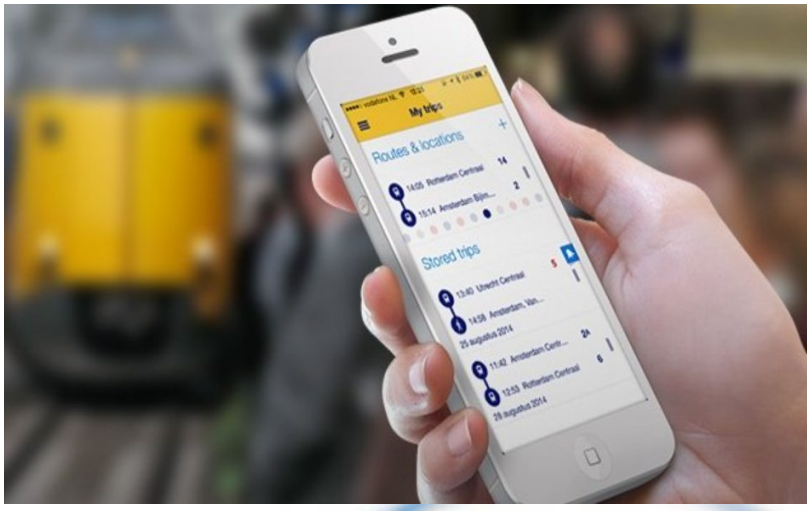
Arrivals for Utrecht Centraal station

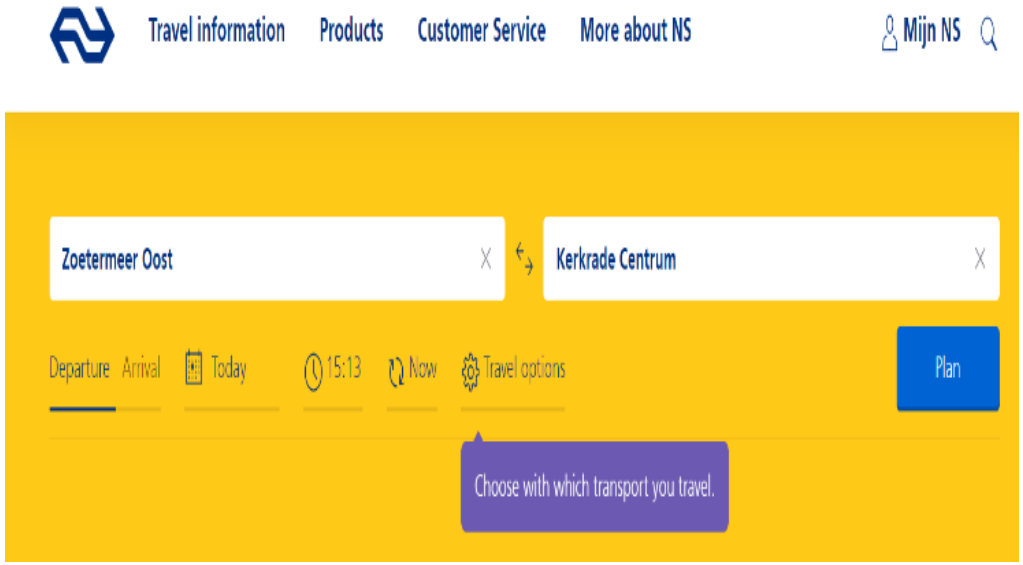
This are trains that have already arrived (up to 30 minutes ago) or will arrive in the next 60 minutes
See also live departures for Utrecht Centraal.

live

14:59 +47 126	ICE International from **Frankfurt (M) Hbf** via Frankfurt Flugh., Köln Hbf, Düsseldorf Hbf, Duisburg Hbf ⚠ Delayed due to excessive delay abroad
15:12 3953	Intercity from **Enkhuizen** via Hoorn, Sloterdijk, Amsterdam C., Amstel
15:12 653	Intercity from **Rotterdam Centraal** via Alexander, Gouda

Digital info of time tables displayed on a smart phone app of Dutch Railway

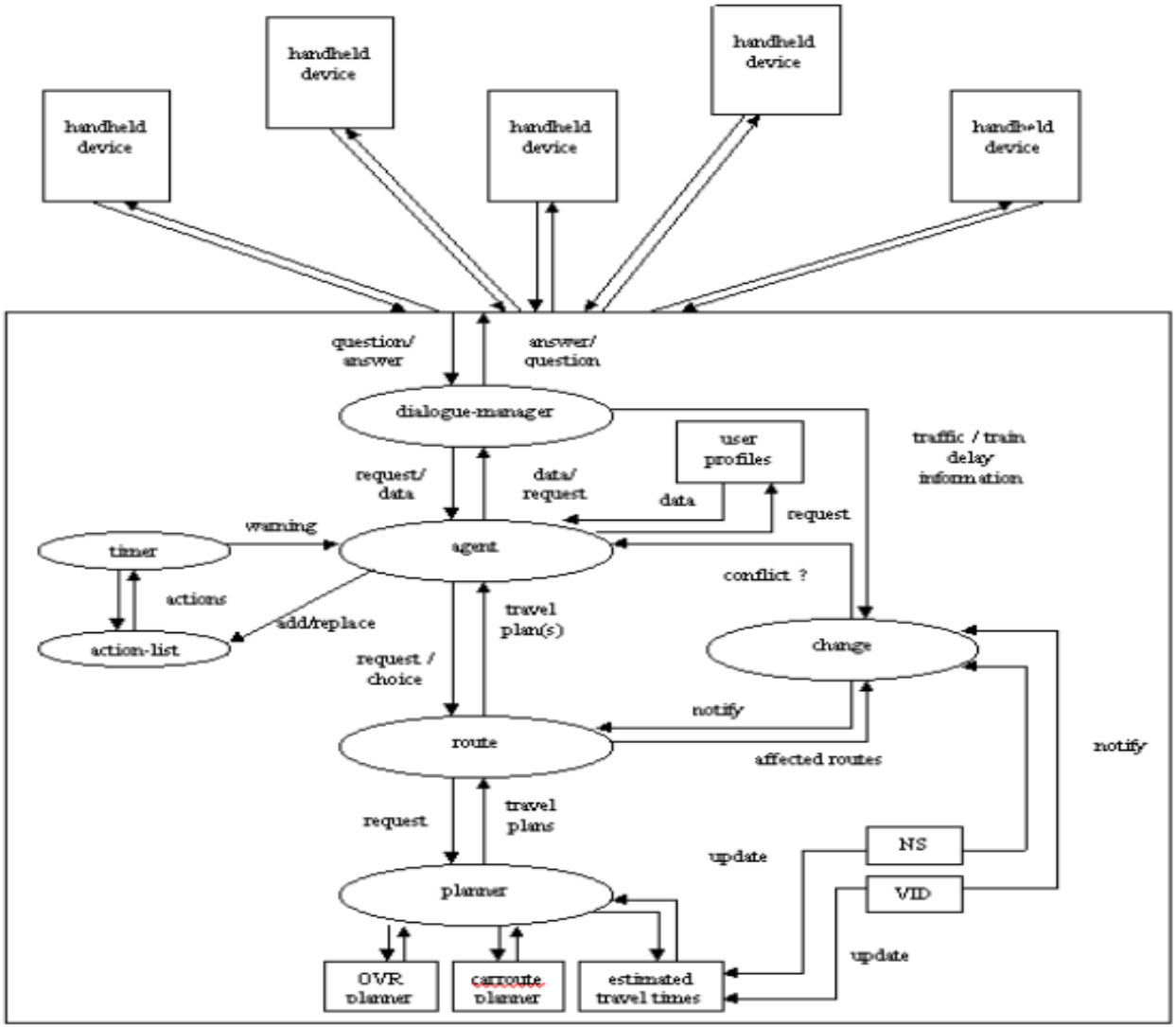




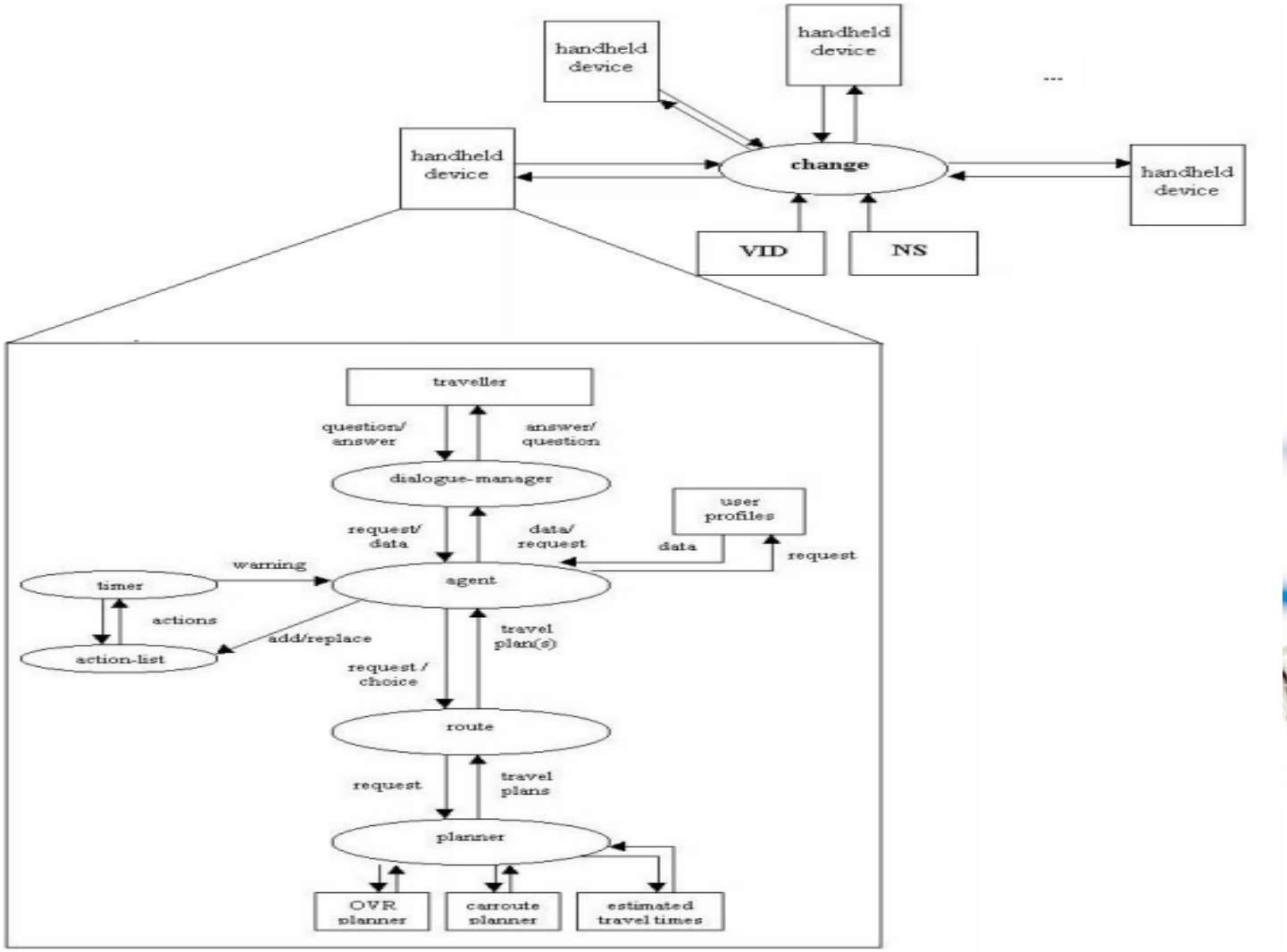
How to combine PITA systems for different railway providers

- NS (Netherlands Dutch Railway provider) is the main exploiter of the Dutch Railway network
- New companies exploiting different parts of the network
- How to provide scheduling and info such that traveller can seamless switch from one company to the other
- Test systems in a simulation envionment

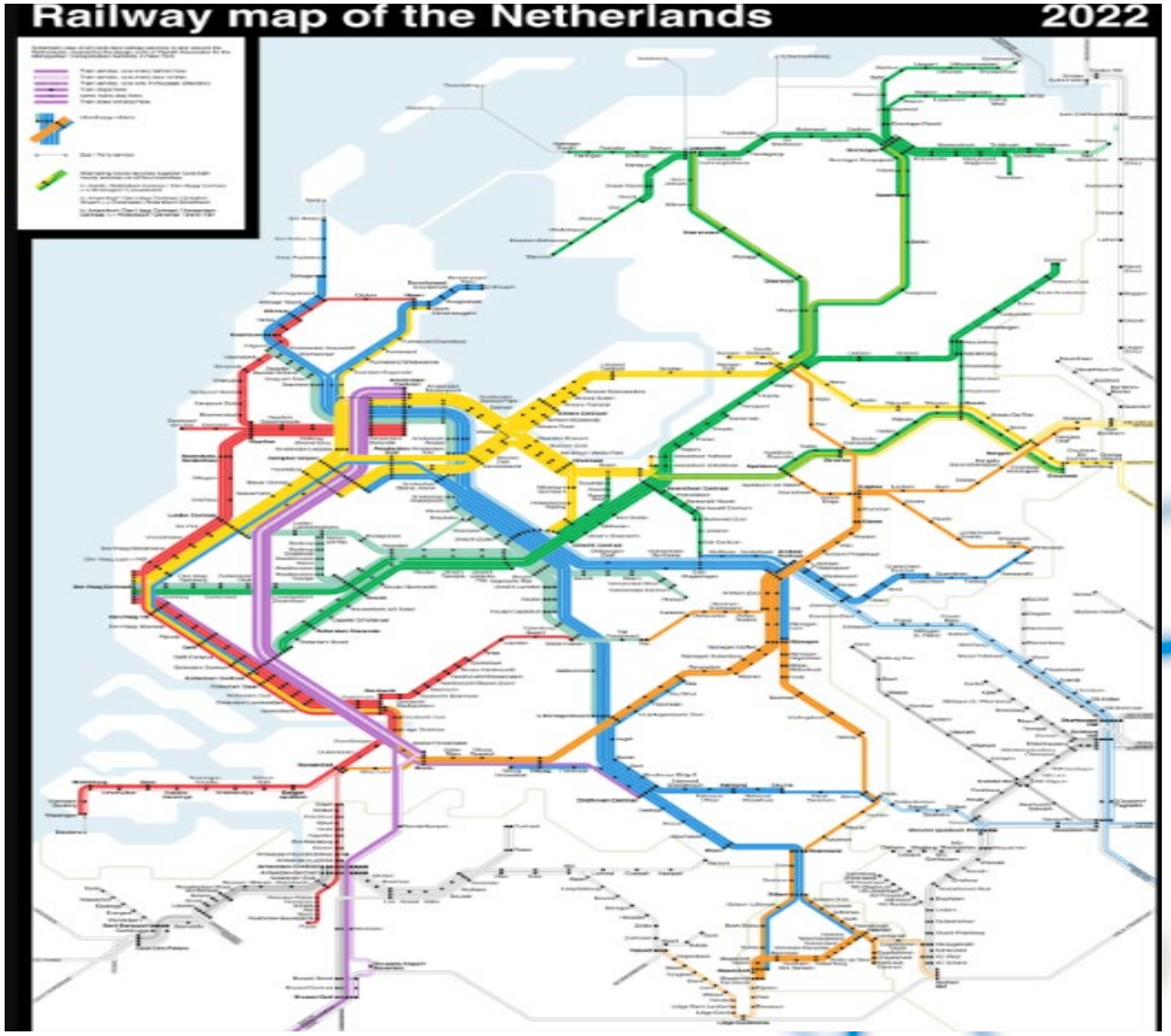
Architecture of centralized PITA system



Architecture of a de-centralized PITA



Railway map of the Netherlands

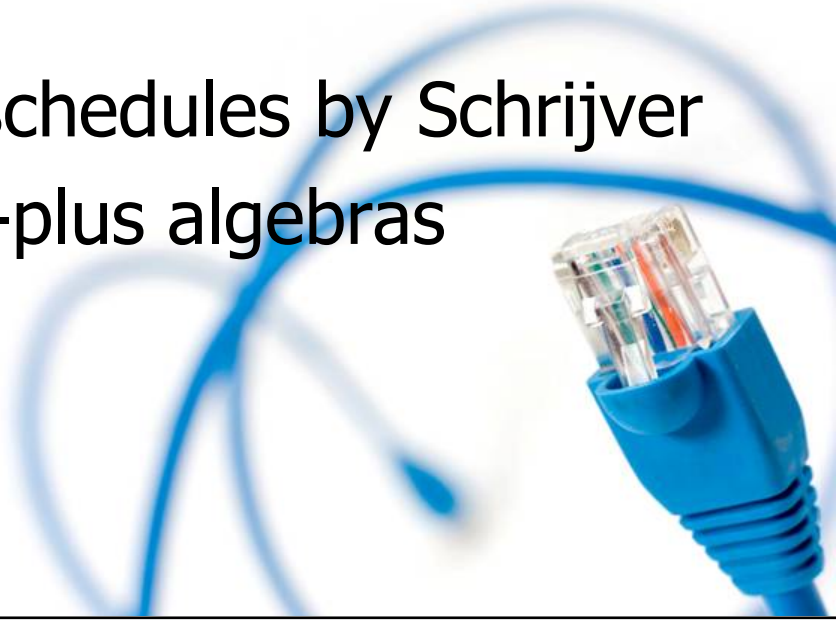


Combination of different railway providers

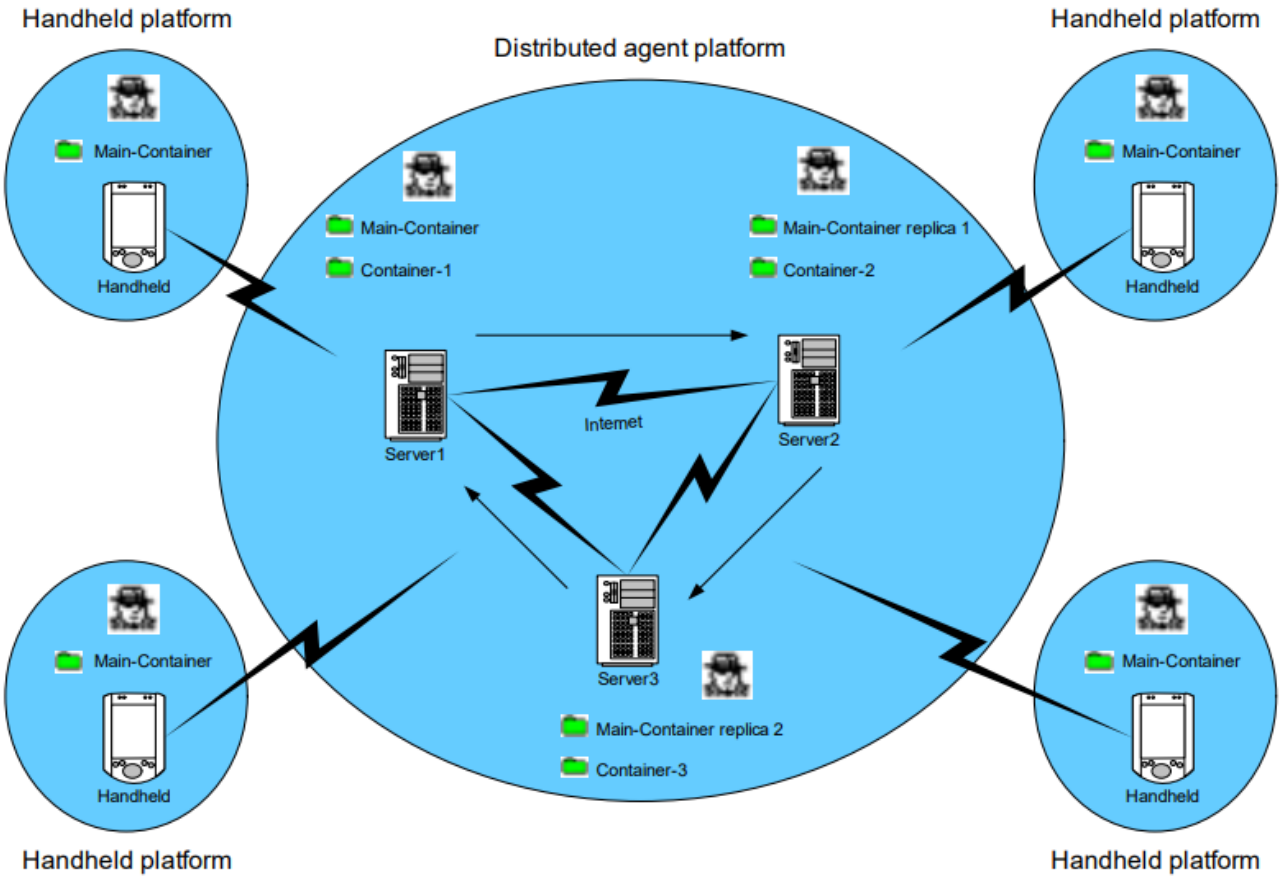
- Backbone of the railwaysystem still exploited by NS.
- At some railway stations traveller have to switch to a network exploited by different company
- How to design a common time table system for different companies?

Simulation of a train system, to test different time table systems

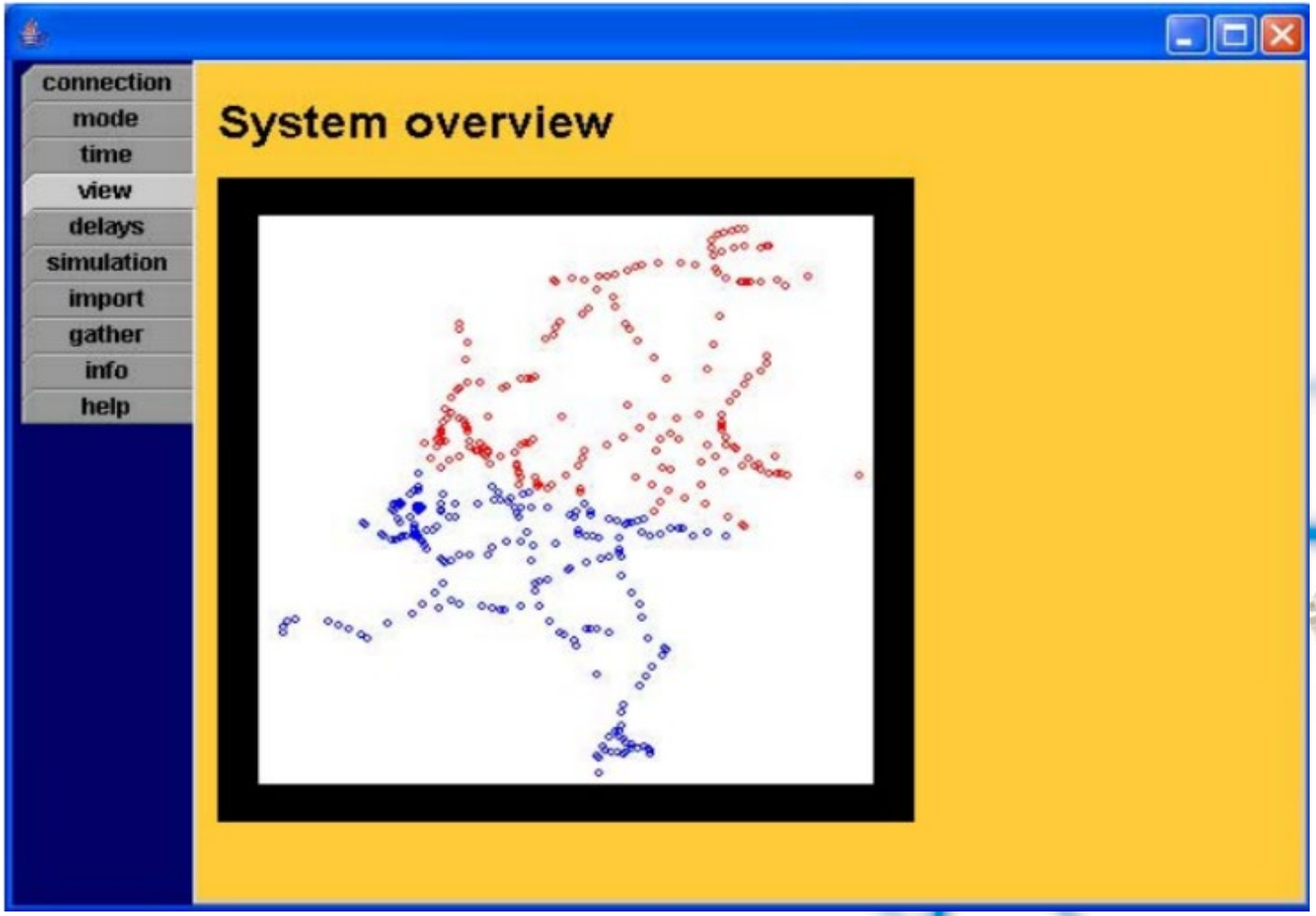
- DUNET algorithm designed by Tulp and co.
- Given the railway tracks, requested frequencies of trains, priority of trains, time tables are generated
- Alternative planning train schedules by Schrijver and Olsder using max-plus algebras



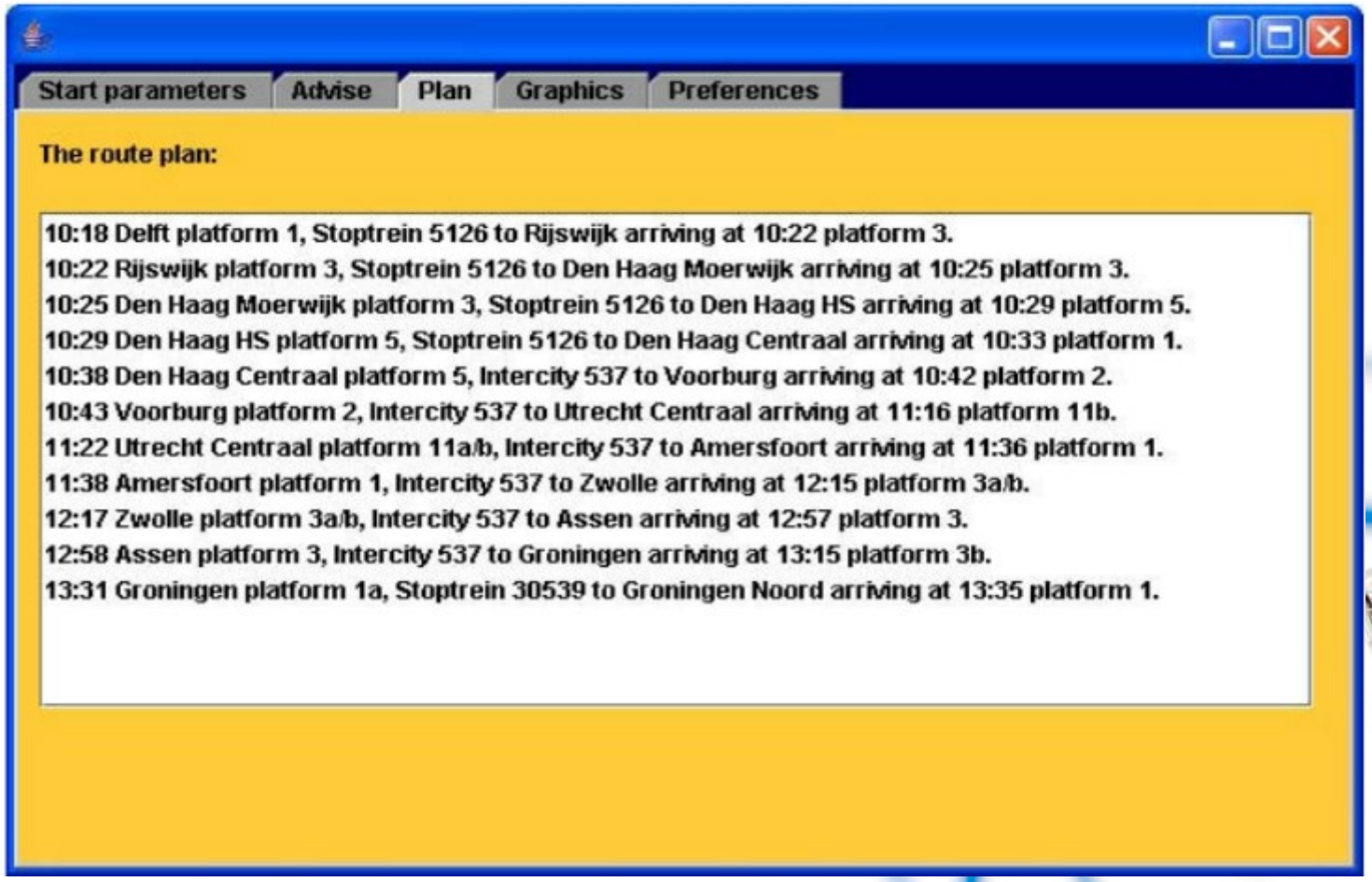
Distributed agent Platform



Region division between multiple Train Providers



Display of a routeplan of sharing different providers



Questions ??