

# NordicWay Interchange Network

## Danish Lessons Learned

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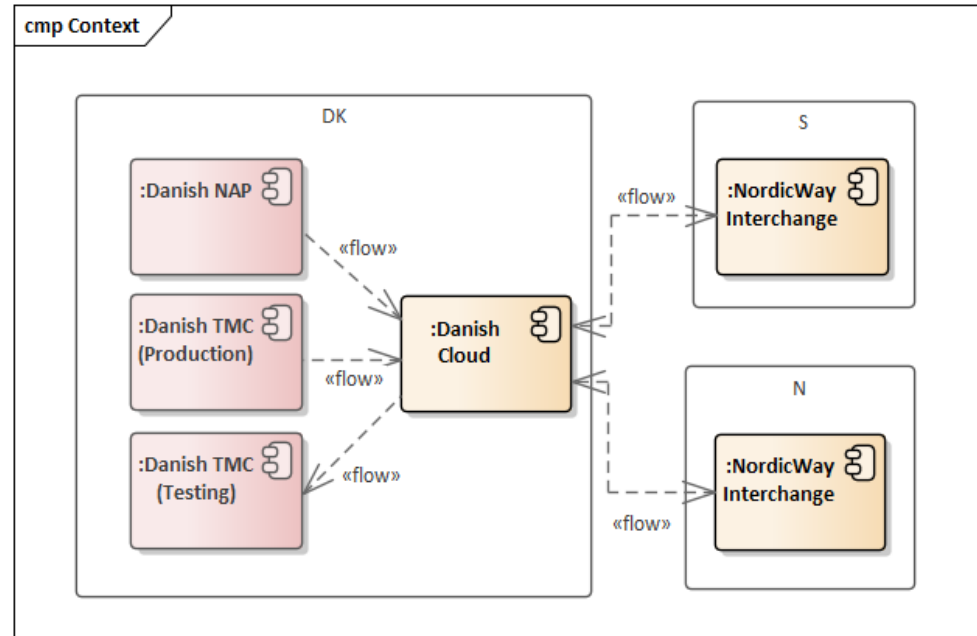
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# NordicWay Interchange Network

## Danish Integration

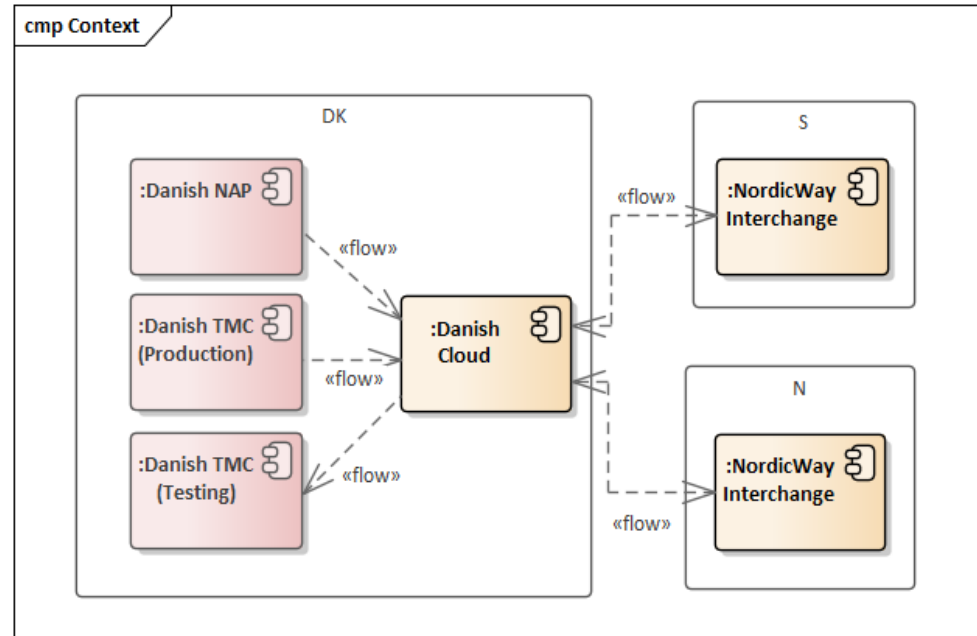
- No Danish pilots
- No Danish Interchange Node
- Danish TMC (production and test) and NAP connected to NordicWay Interchange Network via
  - Swedish Interchange Node
  - Norwegian Interchange Node
- Danish Cloud provides I/F for communicating data as AMQP message payloads



# NordicWay Interchange Network

## Use of Danish Integration

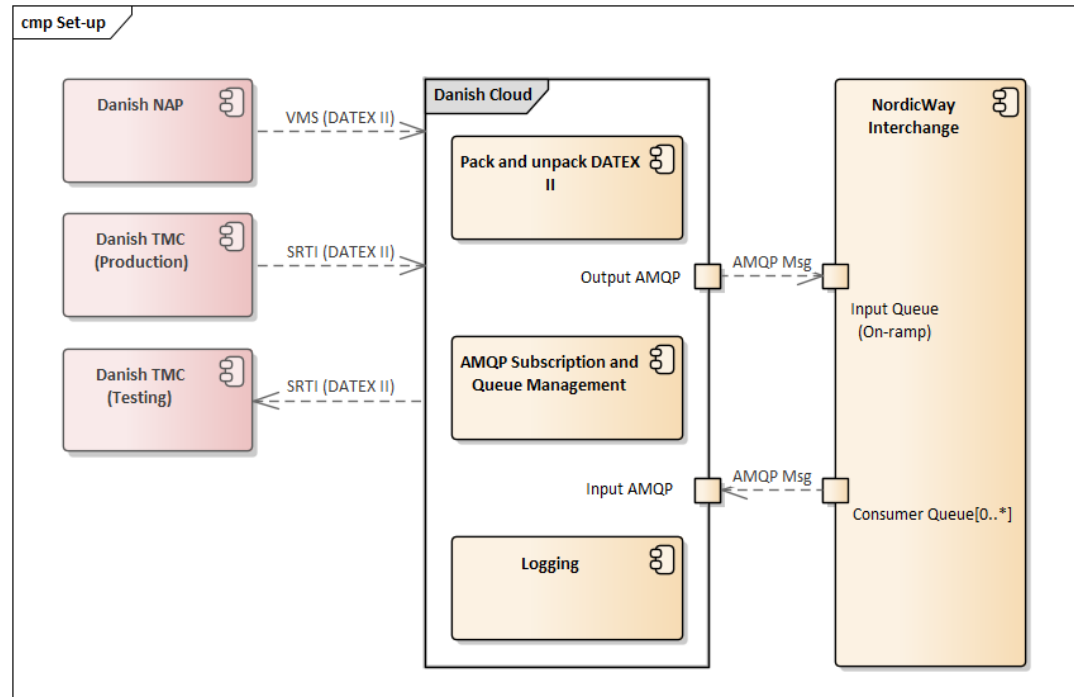
- Pilots: NordicWay Tour
  - Traffic Messages from TMC (production)
  - VMS from Danish NAP
- Internal demonstrations
- Performance measurements
  - From Danish TMC via Danish Cloud to (Swedish) Interchange Node and back again
  - Major contributor to round-trip time is time in Cloud computing



# NordicWay Interchange Network

## Danish Set-up

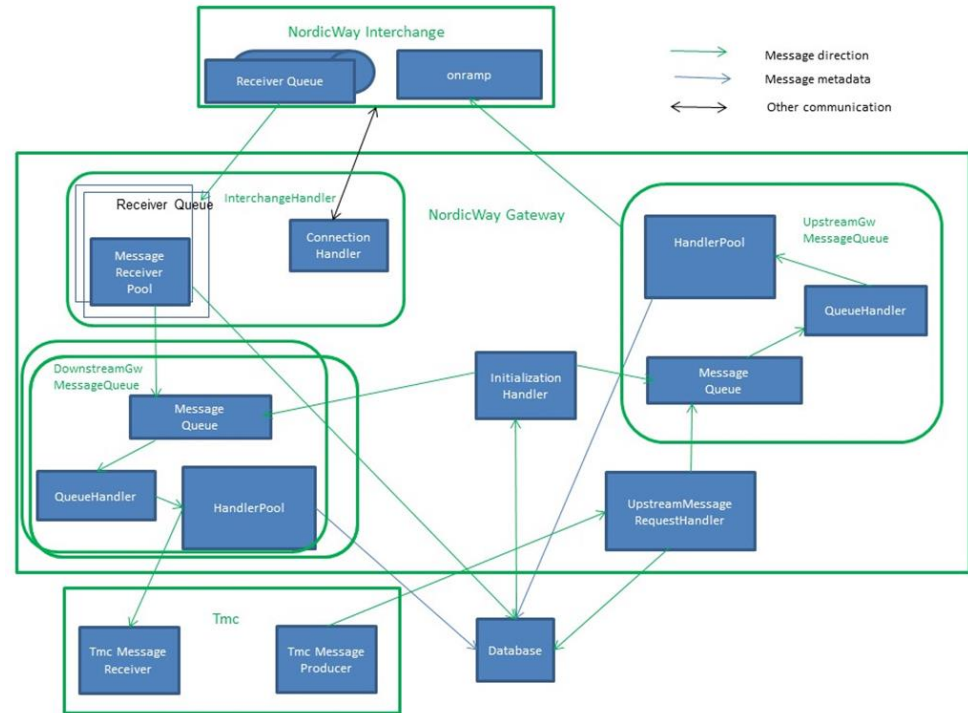
- DATEX II data delivered from Danish production systems
  - Danish TMC
  - Danish NAP
- Danish Cloud packs/unpacks data to/from AMQP messages
- DATEX II data received by Danish Cloud are input to Danish TMC test facilities



# NordicWay Interchange Network

## Design and Implementation

- Qpid Apache Client
- Web Application in
  - Servlet container (Tomcat)
  - Application Server (Oracle WebLogic)
- Programming language
  - Java (JVM)
- Databases
  - Oracle



# NordicWay Interchange Network

## Lessons Learned

- Pros
  - Feasible and versatile solution to IP-based backend communication in C-ITS environments
  - Support multiple standard data models for C-ITS message payloads (including ETSI and DATEX II)
  - Support Publish-Subscribe pattern for C-ITS message exchange
- Cons: Pilot-driven development and deployment – not production-driven
  - Operation:
    - Limited availability: Interchange Nodes operational for the duration of pilots
  - Development, support and maintenance, e.g.
    - Different Interchange Nodes not always compatible
    - Inadequate configuration and release management
    - Documentation not always complete and up-to-date



# NordicWay Interchange Network



## **Danish Cloud Development and Deployment Team**

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