

SCEM in Rail Traffic – Modelling Business Rules

Rainer Müller

Institute for Shipping Economics and Logistics
Universitätsallee GW1 Block A
28359 Bremen, Germany

Supply Chain Event Management (SCEM)

- “old” approach Tracking & Tracing: too passive
- SCEM approach:
 - active monitoring of processes
 - Information only in case of problems
- Introduce „Watchdog“ of the logistics chain
- Processes events occurring during the transport





- MaTIB = Management of Incidents in Rail Transport
- Funded by: Federal Ministry for Education and Research

- Partners:



(Coordinator)



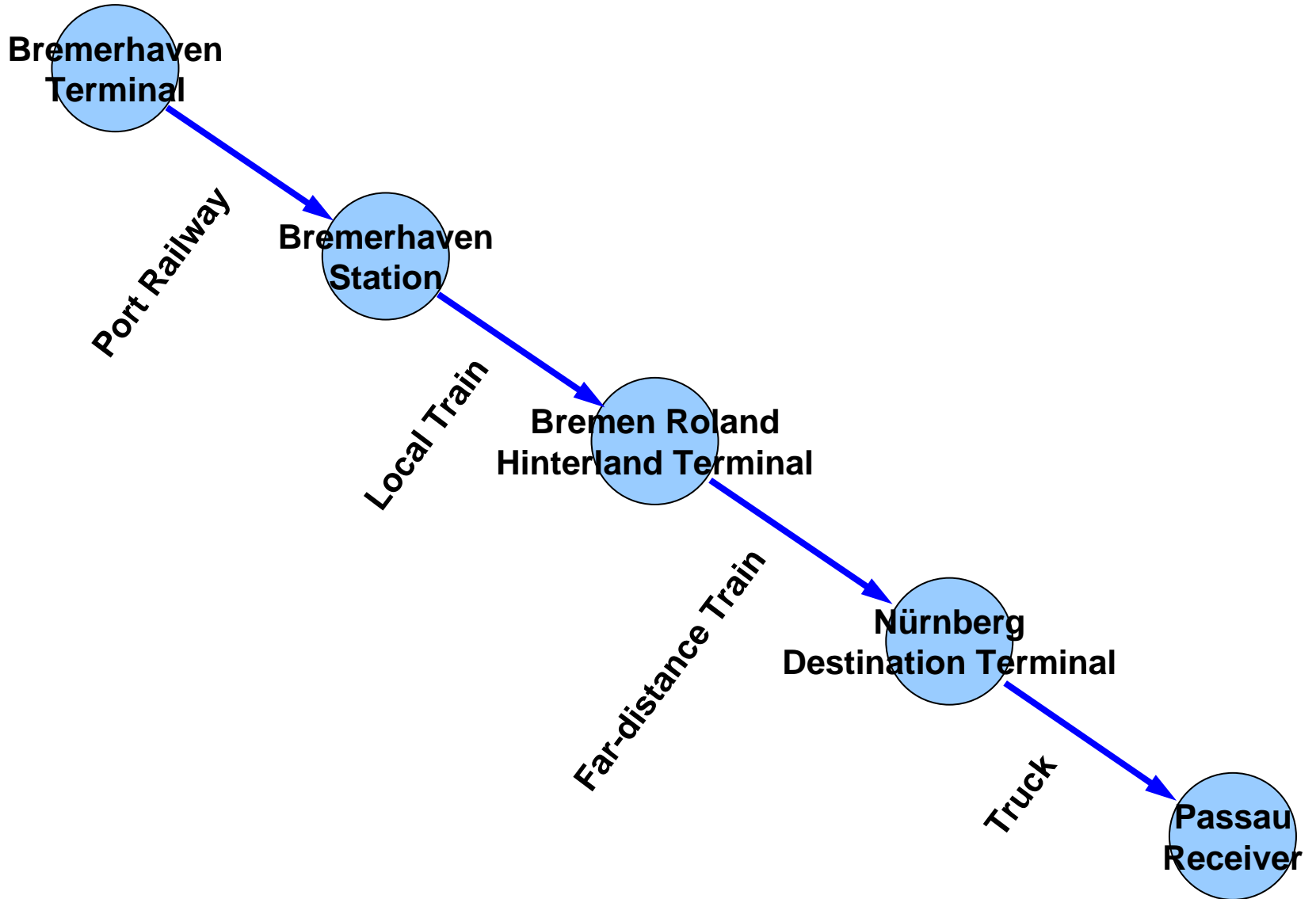
- Topic: SCEM in combined container transport with rail and truck
- Main focus:
 - Support of the resource managers monitoring transports
 - Qualified **Information** for transport clients



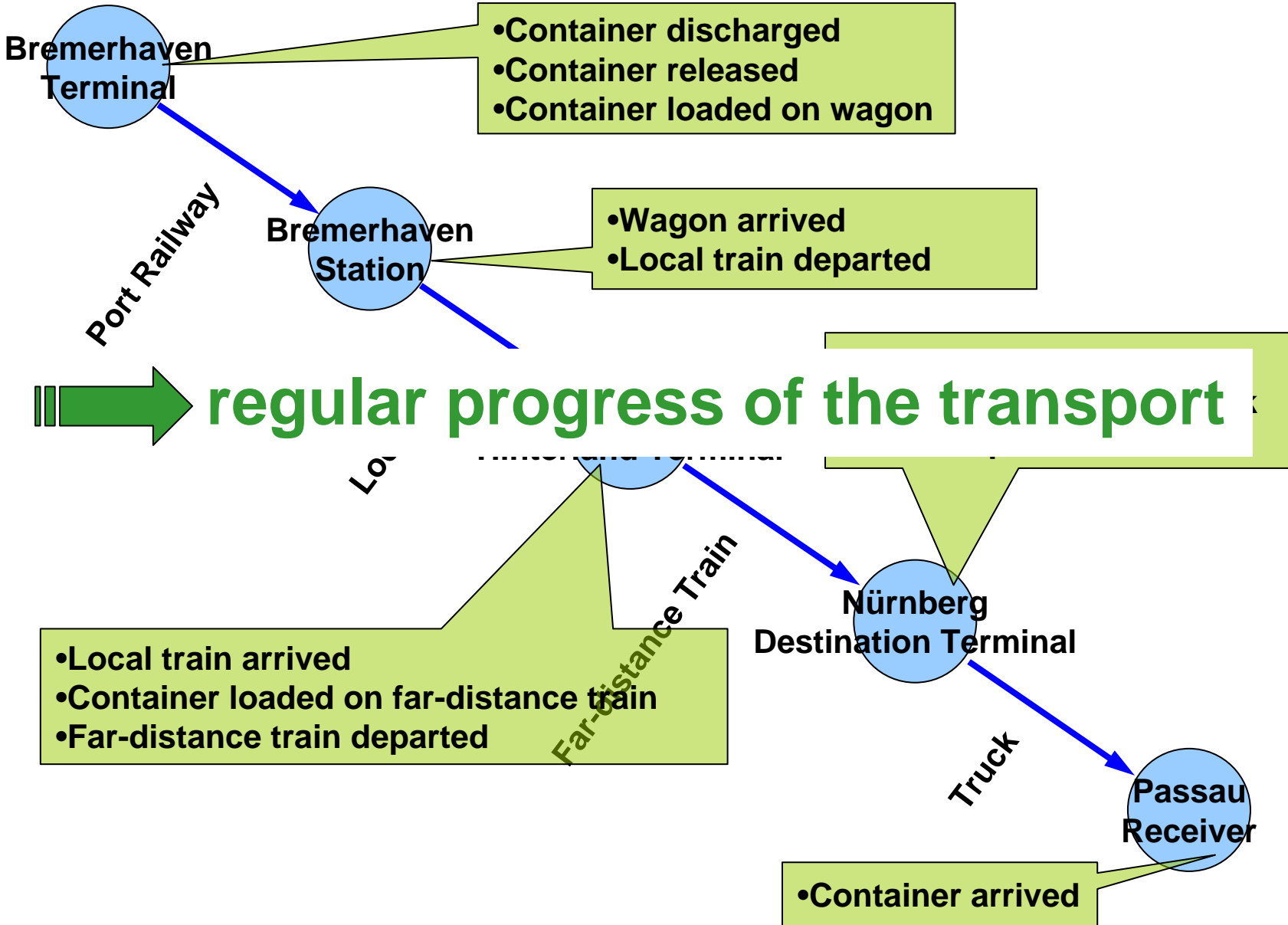
Increasing the attractiveness of combined container transports

- Further Information: www.matib.de

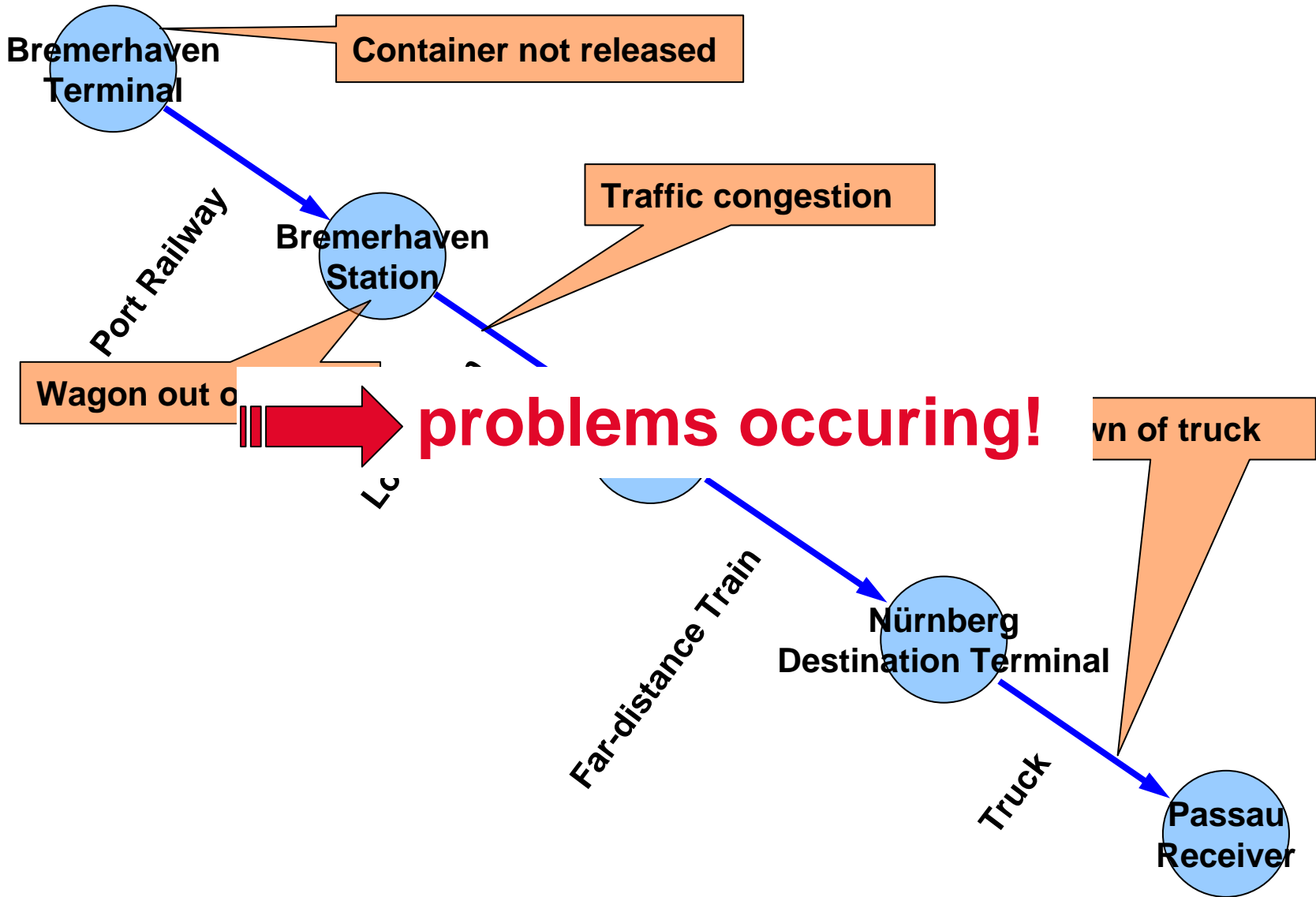
Import Scenario – Transport Chain



SCEM in Transport – Expected Events



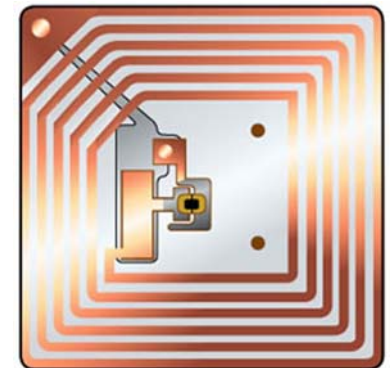
SCEM in Transport – Unexpected Events





SCEM means:

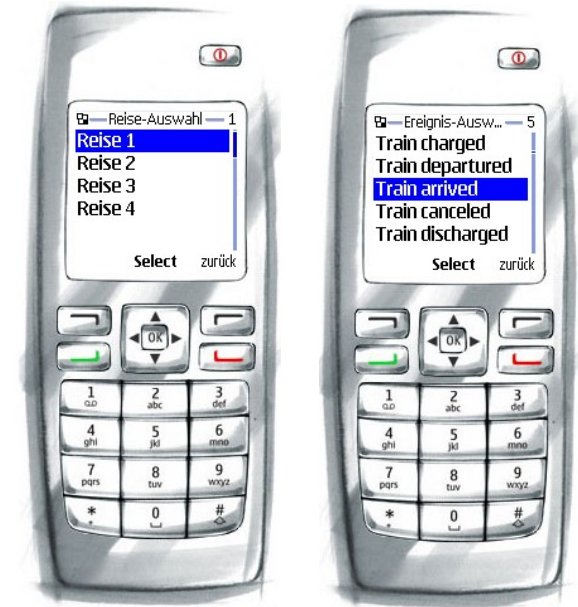
- Monitoring of expected events
 - Automatic detection of unexpected events
 - Detect deviations in an early stage
 - Information only(!) in case of problems
 - Prevent from useless „OK“ messages
 - Achieve new service quality in intermodal transport
-
- Problem: only few automated event sources
 - ⇒ Introduce RFID to automate processes
 - ⇒ Generate events which can be used for SCEM



Leman: Generating events (I)

- **Events via interfaces**
 - Customs
 - Rail operator
 - Terminal operator

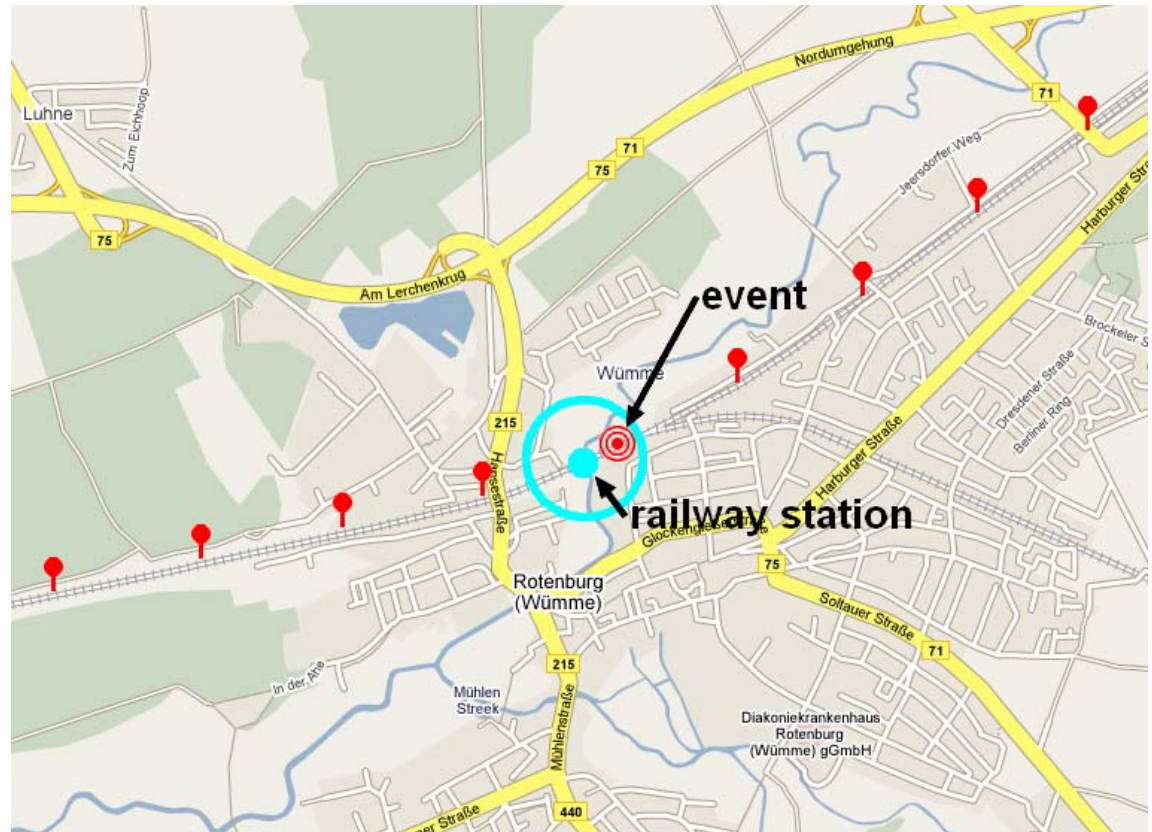
- **Generating events**
 - RFID
 e.g. RFID reader reads transponder of container at terminal (terminal arrival / departure)
 - Mobile phone / Mobile PC
 e.g. locomotive driver sends „Train arrived“ event using mobile application



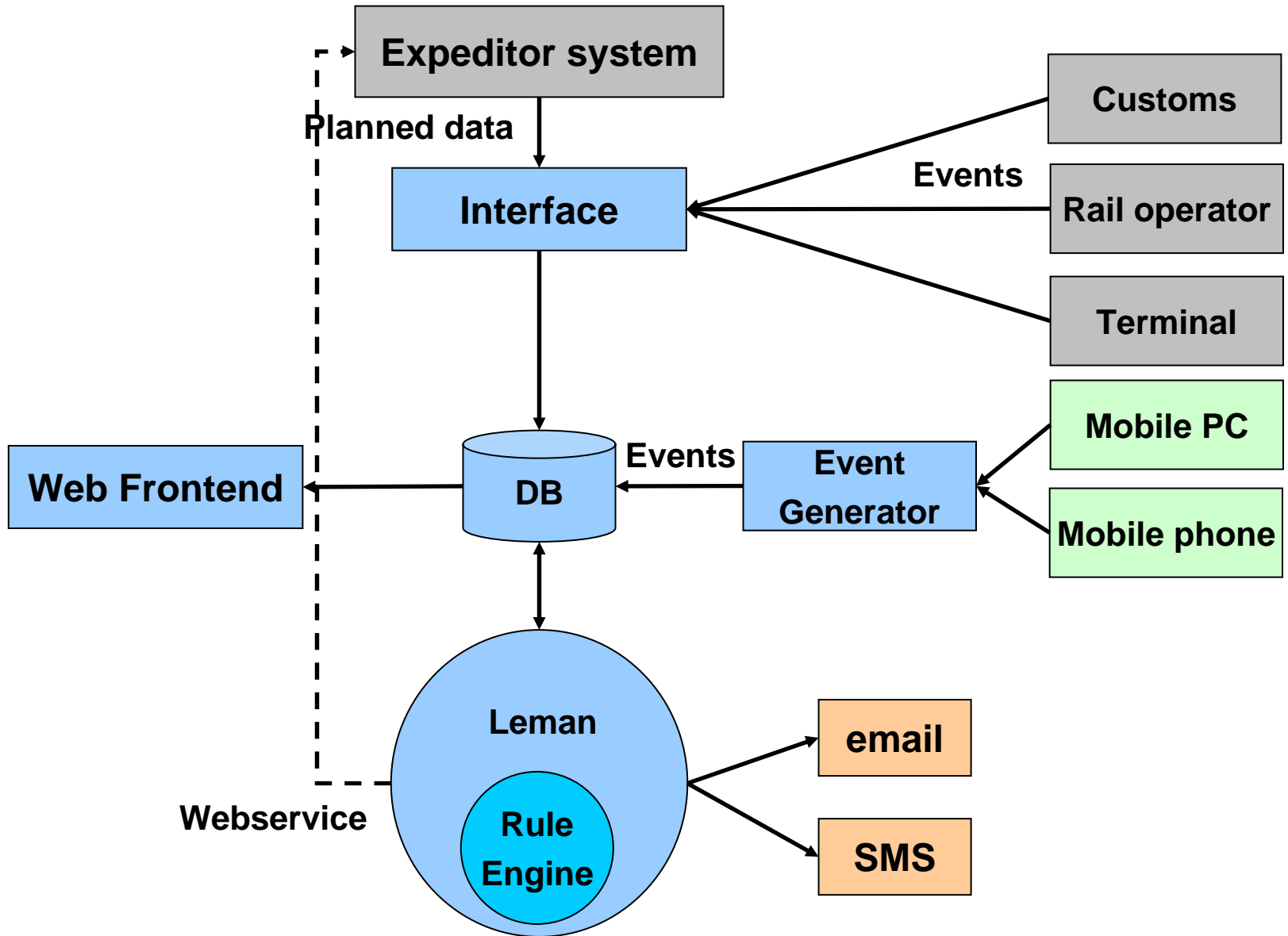
Reise	Reise1	Refresh
Zug Ankunft		
Zug Abfahrt		
Zug Entladung		
Zug Beladung		
Lokschaden		
Verzögerung		
Programm verlassen		

Leman: Generating events (II)

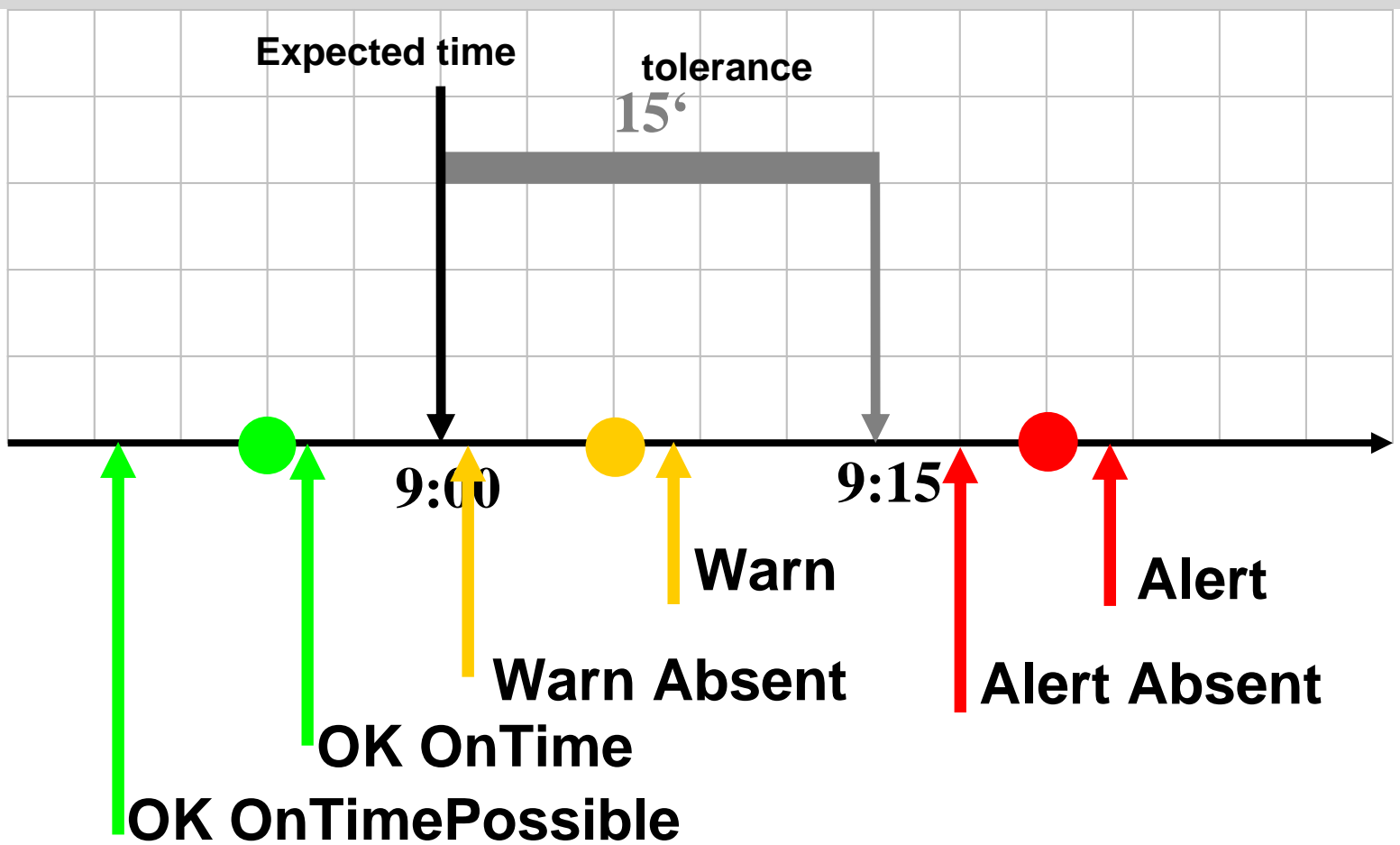
- **Generating events using mobile phone & GPS**
 - GPS coordinates and radius for each terminal in database
 - Mobile phone sends current position to server
 - Server compares current position & terminal coordinates / radius



- **Demonstrator: Leman - Logistics Event Manager**
- **Monitors each registered container**
 - **Planned data (Transport chain and timetable)**
 - **Events (z.B. Container discharged, Train arrived)**
- **Uses ruletree engine (user can modify rules):**
 - **Delay of transport (inside / outside tolerance)**
 - **Which actions has to be fired (email, SMS, Webservice)**
- **Proactive notification – only(!) in case of problems**
- **Prevent from useless „OK“ messages**



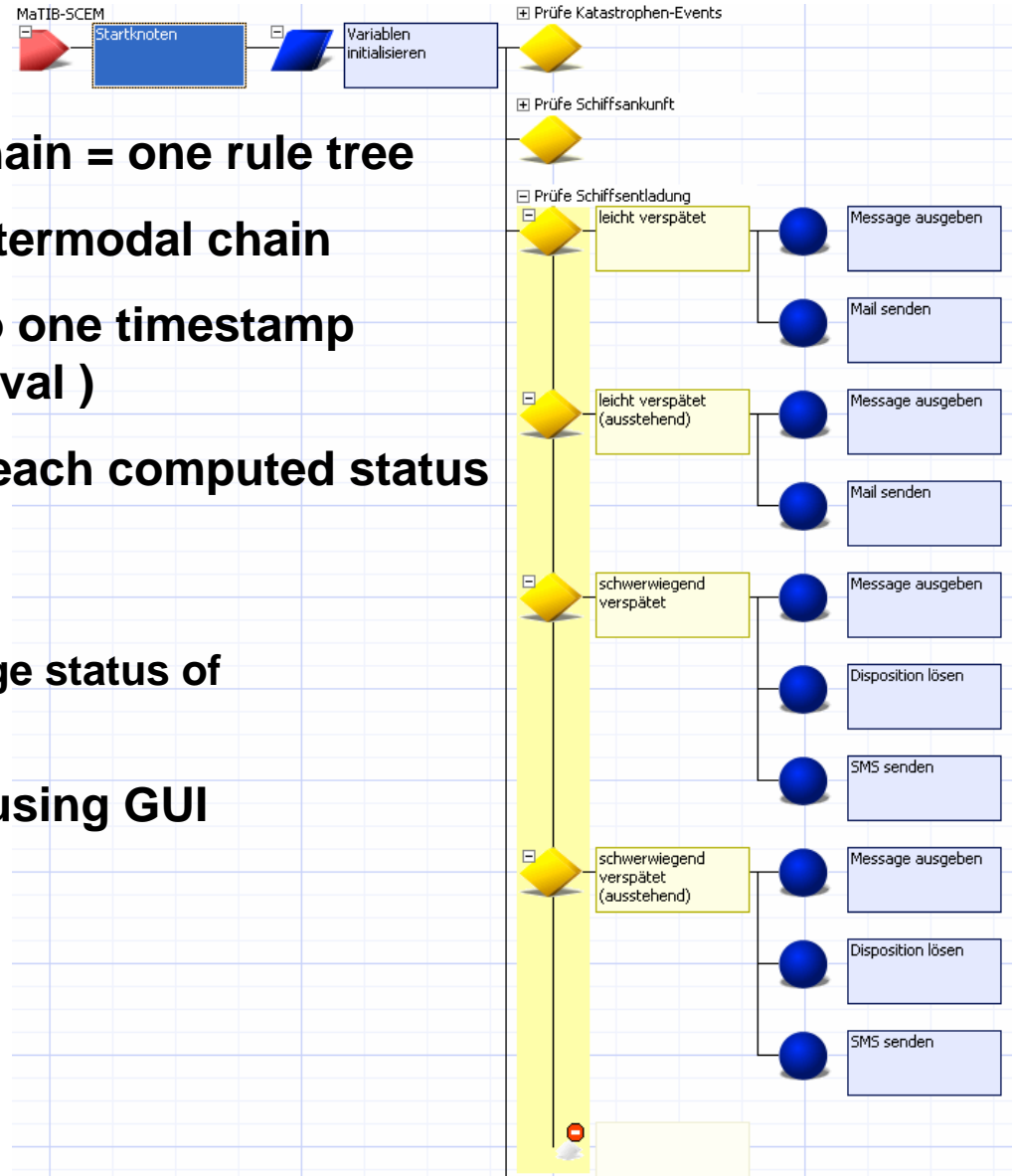
Leman: Status



- Rules of rule engine describes: Which action (email, SMS) for which status

Rule tree

- One part of transport chain = one rule tree
- All rule trees = whole intermodal chain
- Durations are relative to one timestamp (e.g. estimated train arrival)
- Defines the actions for each computed status
 - email
 - SMS
 - Webservice (e.g. change status of transport chain)
- User can modify rules, using GUI
- Software

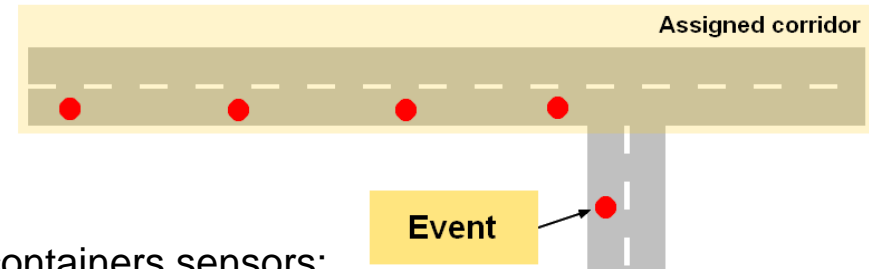


Project GMES: Security Event Manager

- **Fear that containers are used to transport weapons of mass destruction**
 - To use vessels as weapons against ports and other vessels
- **Project GMES**
Global Monitoring for Environment and Security
- **Analysing security related data and events**
 - **Security related data, e.g.:**
 - Value of goods
 - Dangerous cargo
 - **Security related events, e.g.:**
 - Events by smart units / smart containers sensors: breaking the door, temperature, smoke, fire, shock
 - Truck is leaving assigned corridor (using mobile phone & GPS)
 - Standstill
- **Developing demonstrator:**
Security Event Manager
Adapting the SCEM concept to security related events



Limburg attack, 2002



Security factor

- **Security factor:**
How endangered is the transport currently?
- **Security Event Manager computes this factor by examining:**
 - Security related data (e.g. dangerous cargo)
 - Security related events (e.g. standstill of truck in a forrest at night)
- **Factor 0..100 separeted into categories: OK, low and high risk**
 - Used for visualisation purposes



- **Proactive notification of disruptions**

Institut für Seeverkehrswirtschaft und Logistik
Institute of Shipping Economics and Logistics



Rainer Müller

Project Manager

Information Logistics
Section RFID in container transport

t.i.m.e.Port II
Barkhausenstrasse 2
27568 Bremerhaven
Germany

Tel. +49/471/309838-65
rmueller@isl.org

Fax +49/471/309838-55

www.isl.org