Connecting Sensor Network Islands to the Future Internet using the SpoVNet Architecture

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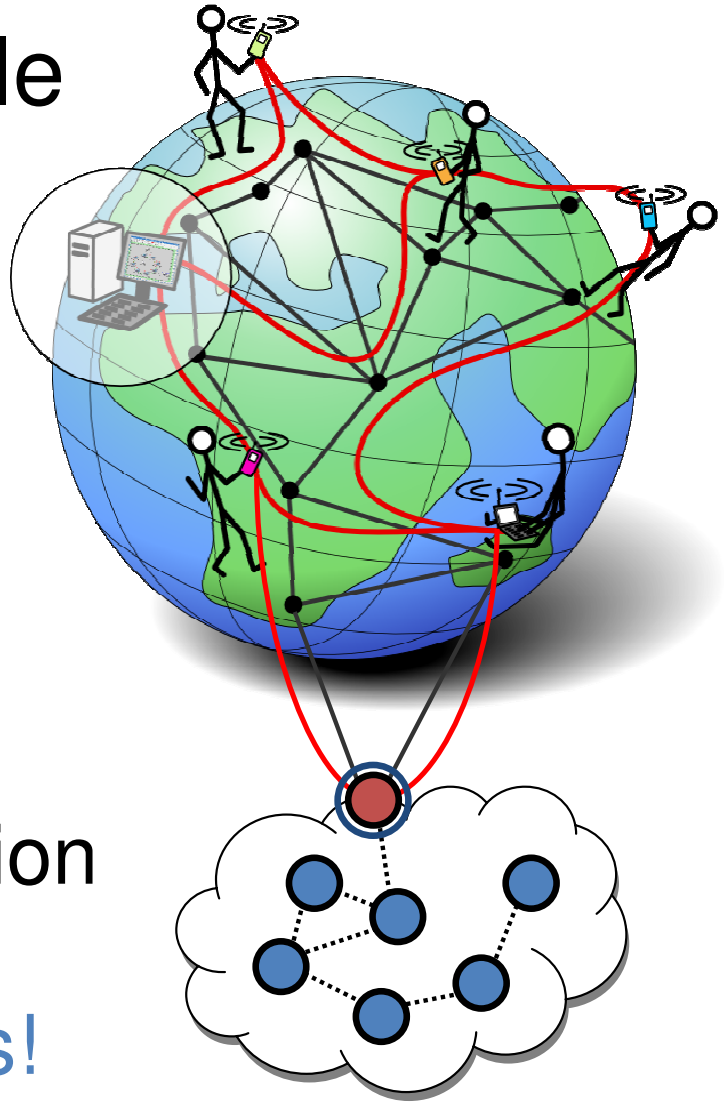
8th Würzburg Workshop on IP: Joint EuroNF, ITC, and ITG Workshop on
"Visions of Future Generation Networks" (EuroView2008)
July 21st - July 22nd 2008, Würzburg/Germany

Our Future Internet Vision

1. Connect any kind of mobile device in heterogeneous environments
2. Easy and flexible service deployment
3. Everything is information
   - don‘t care where information comes from

   → e.g. sensor network islands!



What about a practical scenario?

- „Mobility, heterogeneity, flexible service deployment, sensor networks … “

  ... sounds nice, but why do we need all this?

  → need exemplary scenario based on these features!

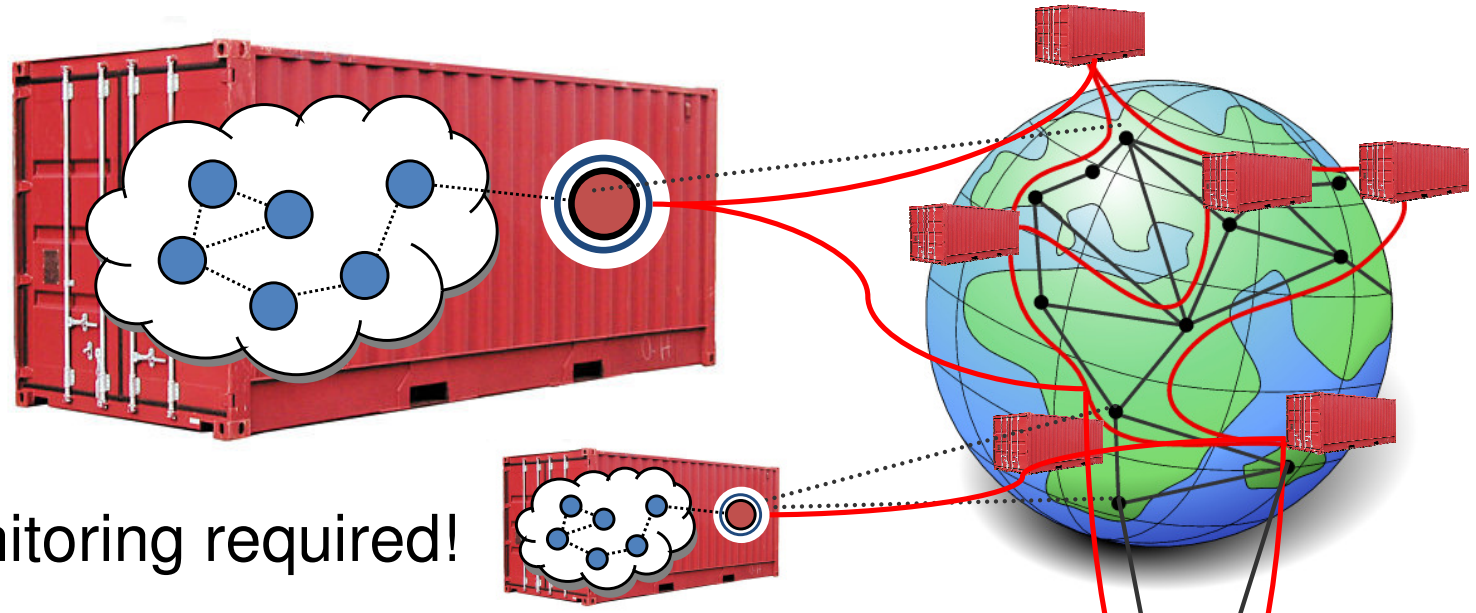
- Our contribution
  1. Provide a scenario that
     - requires mobility, heterogeneity, flexible service deployment, and sensor network islands
     - shows practical applicability and benefits
  2. Explain how the SpoVNet architecture can be used to implement this scenario

Scenario: Cargo monitoring

Temperature sensitive

Dangerous

Expensive



→ Special monitoring required!

Transportation and stationary places

Monitoring

Scenario characteristics

- Monitoring of cargo container transports
  - provide best-continuous online monitoring
  - use heterogeneous connectivity and exploit cargo transport route
  - use sensor networks for monitoring
- Why is this a good scenario?
  - mobile nodes in heterogeneous networks
  - sensor network islands connected to the Internet
  - needs flexible service deployment and security

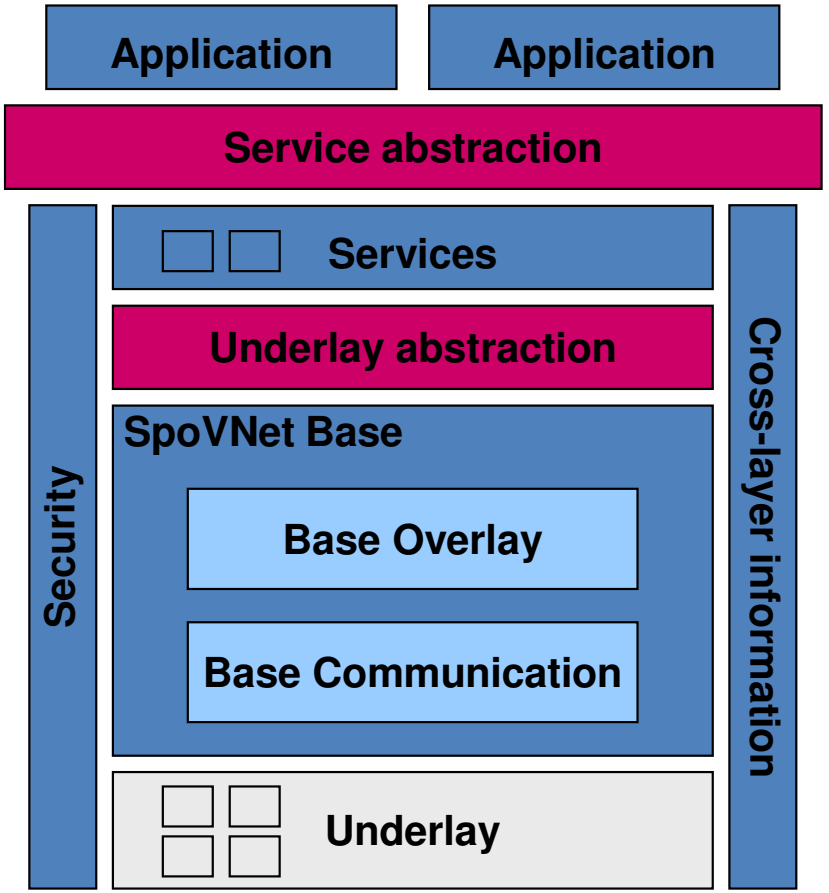
→ shows some real benefit
→ hard to implement with today`s Internet

Scenario details

- Best-continuous online monitoring
  - e.g. transport of temperature sensitive and valuable goods
  - provides early planning of intervention
    - → e.g. replacement of a failed cooling device at next harbor
    - → legal reasons to use in-house mechanics for repairing
- Connectivity
  - WLAN in lading ports, WLAN on trains,
  - satellite connectivity on container ships, …
- Sensor networks for monitoring
  - attached to the container itself
  - attached to goods

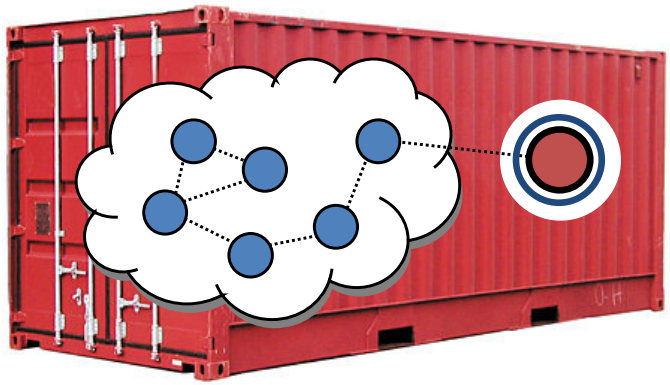
How SpoVNet supports the scenario

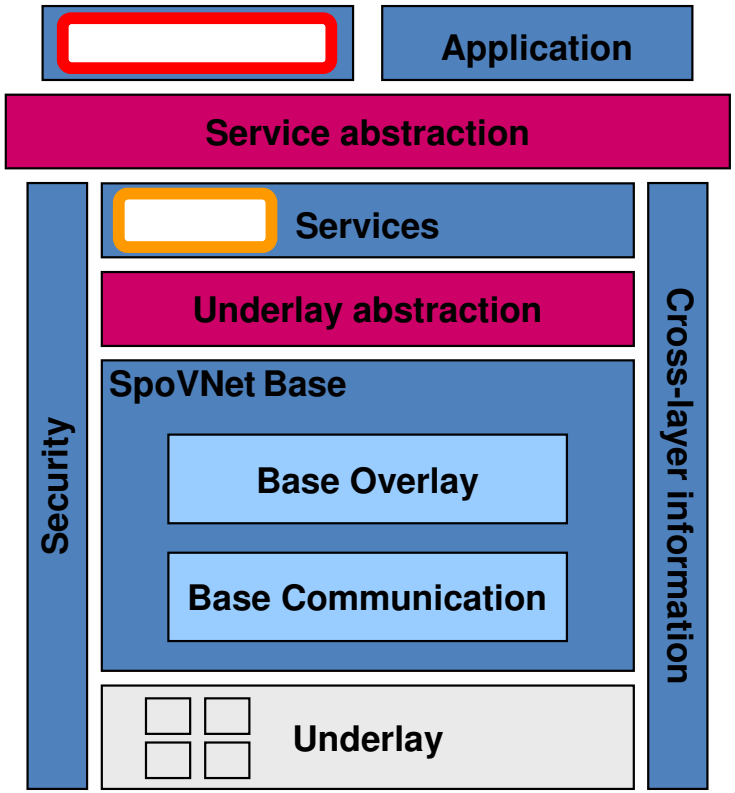
- SpoVNet provides
  - mobility
  - heterogeneity
  - flexible service deployment
  - security/isolation
  - and more …



Implementing the scenario using SpoVNet

1. Implement two new components using SpoVNet
   - Sensor Network Service
   - Container Monitoring Application
2. SpoVNet node per container
   - the sensor network island sink
   - controls the sensor nodes





Conclusions

- We presented
  - an exemplary scenario that utilizes Future Internet features, based on cargo monitoring
  - how to implement the scenario with SpoVNet

- Take-away points
  1. cargo monitoring is very complex and fits quite well as reference scenario
  2. SpoVNet enables flexible service deployment for mobile nodes in heterogeneous environments

Thank you!

Questions?