ONE Simulator
Opportunistic Network Environment Simulator

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ONE Simulator

- Written in Java
- Agent-based, discrete event, network simulator
- Support Mobility Models
- Several built-in DTN routing algorithms

Site:
http://www.netlab.tkk.fi/tutkimus/dtn/theone/
Main functions

- Node movement
- Inter-node contacts
- Routing and message handling
- Results and analysis
  - Visualization
  - Reports
  - Post-processing tools
Node Capabilities

• Nodes $\rightarrow$ basic agents in the simulator

• Models a mobile endpoint acting as store-carry-forward router

• Group of nodes in simulation world
  – Each group is configured with different capabilities
Node Capabilities (cont.)

• Modules in each node have access to the node’s basic parameters
  – including the position, current movement path, and current neighbors

• Node energy consumption model
  – energy consuming activities such as transmission or scanning
Mobility Modeling

• Node movement capabilities are implemented through mobility models

• Three types of synthetic movement models are included:
  – random movement
    • Random Walk (RW) and Random Waypoint (RWP)
  – map-constrained random movement
    • wkt files
  – human behavior based movement
    • Working Day Movement (WDM) model

• Support to load external movement data
Routing

• Simulator includes a framework for defining the algorithms and rules used in routing and comes with ready implementations of well known DTN routing protocols

• There are six included routing protocols:
  – Direct Delivery (DD)
  – First Contact (FC)
  – Spray-and-Wait
  – PRoPHET
  – Max-Prop
  – Epidemic

• Support to adding new routing protocols
Application Support

• Two ways to generate application messages inside the simulation
  – message generators
  – external event files
Reporting and Visualization

• Graphical User Interface (GUI)
• Reports
  – Some statistics
  – Post-processing tools

Example message paths from node p1 to p2

Screenshot of the ONE simulator’s GUI
Creating Simulation Scenarios

• Scenarios are built by defining the simulated nodes and their capabilities

• Defining the basic parameters
  – Number/group of nodes
  – storage capacity
  – transmit range and bit-rates
  – movement and routing models to use
  – Specific parameters

• Simple text-based configuration files