Static Routing for DTN
draft-dowdell-dtn-static-routing-00

- John Dowdell, Airbus Defence and Space
  Nabil Benamar, University of Moulay
  Ismaïl Meknes
Previous works

• Static Routing in non-Delay Tolerant networks
  – RFC1812 “Requirements for IP Version 4 Routers”, section 7.4
  – Unable to find an RFC for IPv6 static routing.

• Static Routing implementations in DTN
  – DTN2 - available on SourceForge
  – ION - DTN for spacecraft, also on SourceForge
ONE

• Opportunistic Network Environment
• It’s “THE” simulator to use for DTN
• Widely used in research papers
• Doesn’t take into account node address
• Still no clear definition of addressing in DTN context
• Especially for terrestrial use cases
  – Suggestions have been done for Interplanetary networks (DTN Naming and Addressing- Keith Scott July 11, 2008 )
To route, you must address

• How to address a node that has no known IP address?
• Use domain name? But what is the domain?
  • Nodes owned by a single organisation? Eg node_id.example.com
  • Nodes in a common area? node_id.example.area
  • Local nodes? nodes.near.me
  • Nodes used as mules for distant networks? anyone.going.that.way
• Domain membership could be static or transitory
• ... which leads to the problems of addressing single and multiple (multicast?) nodes
• ... and then somehow tie a resolved address to an interface
Terrestrial Use cases

• Accessing a particular bus for M2M purposes, e.g. engine health?
• Accessing a particular bus for driver information, e.g. roadworks, congestion or accident notification?
• Accessing a particular bus for security purposes, e.g. monitoring CCTV after driver presses alarm button?
• Asking {any, a particular} bus to deliver or retrieve some user data to an area beyond static network coverage or mobile network dark area?
• Asking any bus to take custody of some user data to be relayed to another specified bus?
• Notifying all busses in a geofenced area, e.g. security alert?
• Hoping to transfer some information via a non-DTN network extended to a nominated bus stop?
Routing Table Entry

• What should a DTN static routing table entry contain?
  – Address - DTN uses Endpoint Identifiers
  – Interface - DTN uses Convergence Layers
  – Metric - relative preference of this route
  – Time - Earliest (and Latest?) time this entry is valid for