

Fine-Grained Tracking of Human Mobility in Dense Scenarios

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"Platoon" of devices distributed to faculty members, PhD students, and staff

GOALS:

- Improve understanding of Pocket Switched Networks in workplaces
- Ensure long unmanned experiments
- Show impact of unplanned (short) contacts on routing
- Flexible design; profiled users

MODE OF OPERATIONS:

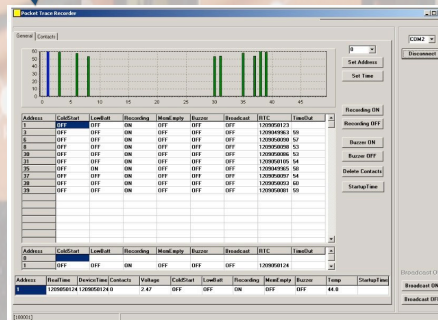
- Frequent beaconing; short radio range
- Hardware designed to ensure long battery life
- Portable equipment

RESULTS:

- Routing: short contacts yield low bandwidth but provide high coverage with low latency
- Aggregated bandwidth: non-negligible contribution, but variable during the day

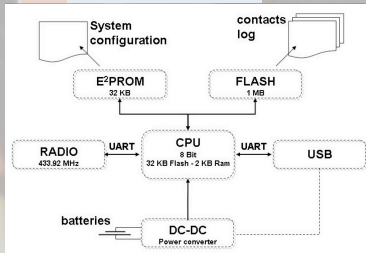


Circuitry and package of a PMTR. In the packed version, the antenna is fixed all around the box, to avoid accidental disconnections



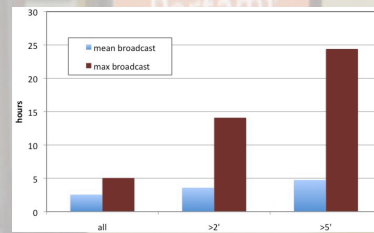
GUI of the Desktop application used to configure and monitor the devices and to support data collection

Device architecture

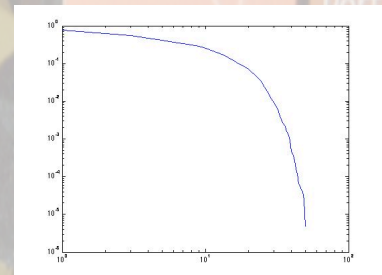


	Threshold = 2'	Threshold = 5'
# short contacts	46.67%	66.30%
All contacts - capacity	1976 Mb	1976 Mb
Long contacts - capacity	3180 Mb	4980 Mb

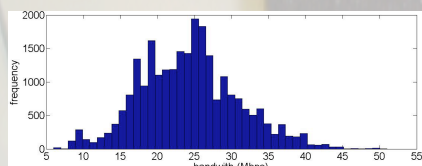
Unicast routing measures



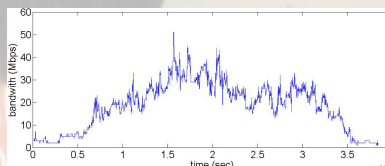
Latency for broadcast transmissions



Distribution of inter-contact times



Histogram of the aggregated bandwidth



Aggregated bandwidth during a day

	Threshold = 2'	Threshold = 5'
Contrib	4.56%	9.46%
AggBwth_all	7.03 Mbps	7.03 Mbps
AggBwth_short	6.70 Mbps	6.36 Mbps

Bandwidth availability

ROUTING

AGGREGATED BANDWIDTH



Network Protocols and Technologies Laboratory



"Context-Aware Routing Over Opportunistic Networks" Project (<http://cartoon.nptlab.dico.unimi.it>)