IETF Hackathon: OpenWSN Project

IETF 104

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Prague

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6TiSCH
OpenWSN
This is the biggest hackathon ever!!

What we planned to do

- OpenWSN Project
  - Open source
  - Implementation of 6TiSCH stack
    - Firmware: openwsn-fw
    - Software: openvisualizer, coap

www.openwsn.org

- OpenBenchmark Project
  - Open source
  - benchmark 6TiSCH stack in a reproducible manner
    - Front end: web interface to monitor experiment
    - Back end: interact with motes in the testbed

6TiSCH OPEN DATA ACTION

https://benchmark.6tis.ch

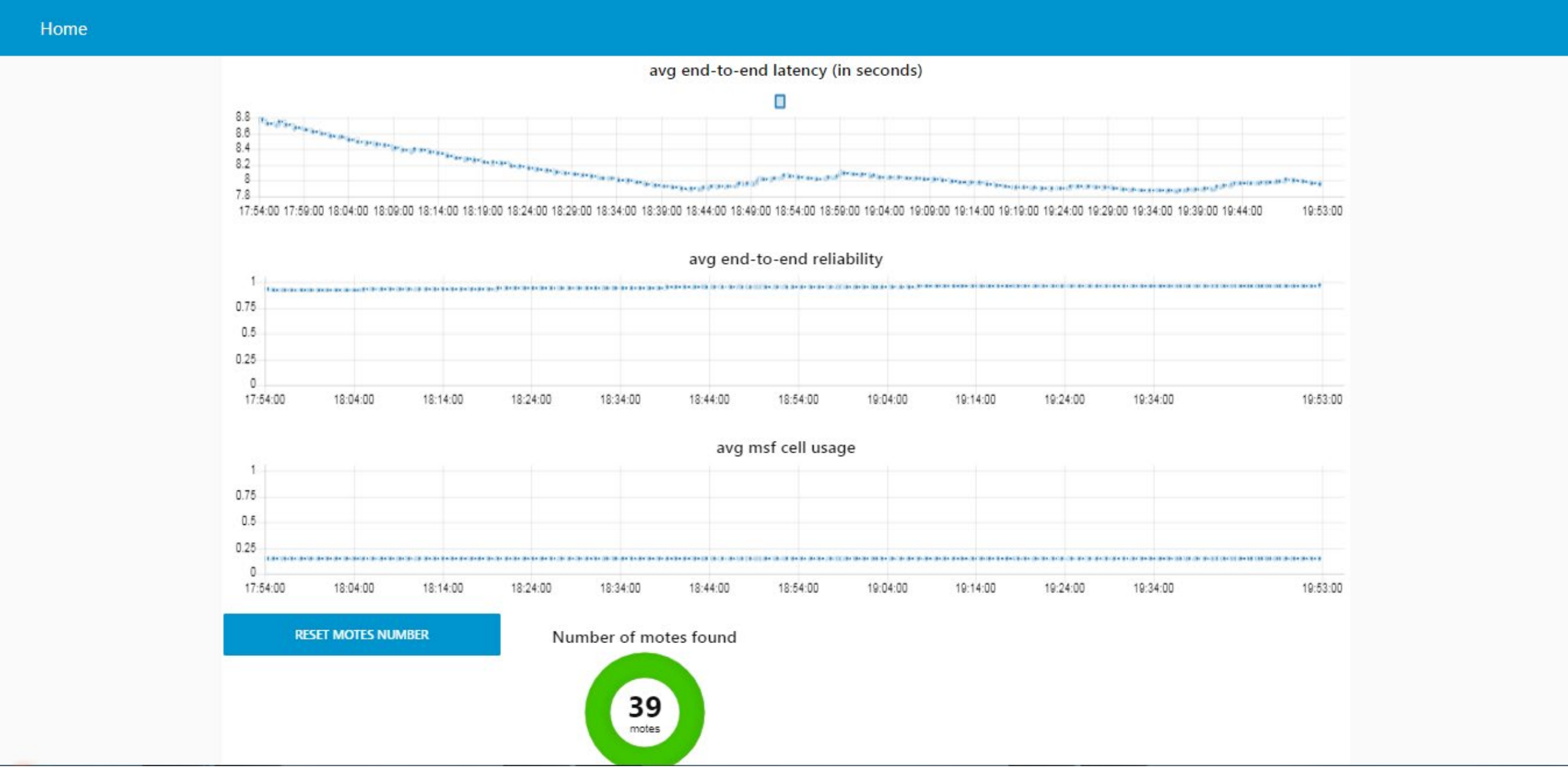
What got done (1/2)

- Benchmarking server is able to configure the motes in the testbed to
  - Set Tx power
  - Set DAG root
  - Send packet
  - …

```
(vagrant@ubuntu-xenial:~/openbenchmark/experiment-orchestrator$ python ../experiment-provisioner/main.py --action=otbox-flash --scenario=demo-scenario
Script started
Flashing OTBox
Connected to broker: argus.paris.inria.fr
Sending firmware to motes
(vagrant@ubuntu-xenial:~/openbenchmark/experiment-orchestrator$ python main.py
[MAIN] Starting MQTT client
[MAIN] Acquiring lock...
[MQTT CLIENT] Connected to the broker. Subscribing...
[MQTT CLIENT] Subscribing to: openbenchmark/experimentId/wfbp7/response/sendPacket
[MQTT CLIENT] Subscribing to: openbenchmark/experimentId/wfbp7/response/configureTransmitPower
[MQTT CLIENT] Subscribing to: openbenchmark/experimentId/wfbp7/+/echo
[MQTT CLIENT] Subscribing to: openbenchmark/experimentId/wfbp7/response/triggerNetworkFormation
[MQTT CLIENT] Subscribing to: openbenchmark/command/startBenchmark
[MQTT CLIENT] Subscribing to: openbenchmark/experimentId/wfbp7/nodeId/+/performanceData
[MQTT CLIENT] Subscribed to all
[MAIN] Lock released on 'startBenchmark' command
{u'scenario': u'demo-scenario', u'firmware': u'openwsn', u'token': u'51e4245226fd4719', u'testbed': u'iotlab', u'date': u'Sun, 24 Mar 2019 18:39:06 +0000', u'nodes': {u'05-43-32-ff-03-da-a1-67': u'node-a8
-118', u'05-43-32-ff-03-da-b4-54': u'node-a8-117', u'05-43-32-ff-03-db-c1-63': u'node-a8-116'}, u'api_version': u'0.0.1'}
[API] {"token": "axzg", "success": true}
[API] {"token": "0xen", "success": true}
[API] {"token": "d4pi", "success": true}
[NETWORK PREP] Transmission power configured successfully
[API] {"token": "ygoq", "success": true}
[NETWORK PREP] Network formation triggered successfully
[MAIN] Scheduler will start in 0.1 minutes...
[SCHEDULER] Starting schedule:
node-a8-116 at 8.237: from 05-43-32-ff-03-db-c1-63 to 05-43-32-ff-03-da-a1-67
node-a8-116 at 28.267: from 05-43-32-ff-03-db-c1-63 to 05-43-32-ff-03-da-a1-67
node-a8-116 at 29.302: from 05-43-32-ff-03-db-c1-63 to 05-43-32-ff-03-da-a1-67
node-a8-118 at 183.743: from 05-43-32-ff-03-da-a1-67 to 05-43-32-ff-03-db-c1-63
node-a8-117 at 197.643: from 05-43-32-ff-03-da-b4-54 to 05-43-32-ff-03-db-c1-63
node-a8-116 at 270.126: from 05-43-32-ff-03-db-c1-63 to 05-43-32-ff-03-da-a1-67
node-a8-116 at 344.052: from 05-43-32-ff-03-db-c1-63 to 05-43-32-ff-03-da-a1-67
```

What got done (2/2)

- draft-ietf-6tisch-msf version 02 is implemented and optimized
  - An OpenWSN performance dashboard available at:
    - https://openwsn-dashboard.eu-gb.mybluemix.net/ui


Home
avg end-to-end latency (in seconds)
8.8
8.6
8.4
8.2
8
7.8
17:54:00 17:59:00 18:04:00 18:09:00 18:14:00 18:19:00 18:24:00 18:29:00 18:34:00 18:39:00 18:44:00 18:49:00 18:54:00 18:59:00 19:04:00 19:09:00 19:14:00 19:19:00 19:24:00 19:29:00 19:34:00 19:39:00 19:44:00 19:53:00
avg end-to-end reliability
1
0.75
0.5
0.25
0
17:54:00 18:04:00 18:14:00 18:24:00 18:34:00 18:44:00 18:54:00 19:04:00 19:14:00 19:24:00 19:34:00 19:53:00
avg msf cell usage
1
0.75
0.5
0.25
0
17:54:00 18:04:00 18:14:00 18:24:00 18:34:00 18:44:00 18:54:00 19:04:00 19:14:00 19:24:00 19:34:00 19:53:00
RESET MOTES NUMBER
Number of motes found
39
motes

Links

- Code available at:
  - https://github.com/openwsn-berkeley/openwsn-fw/
  - https://github.com/openwsn-berkeley/openvisualizer
  - https://github.com/openwsn-berkeley/openbenchmark
- activity available at GitHub and JIRA system:
  - https://github.com/malishav/openwsn-fw/commits/develop_FW-808
  - https://github.com/malishav/openvisualizer/commits/OV-7
  - https://github.com/malishav/openbenchmark/tree/ietf104/hackathon
  - https://github.com/openwsn-berkeley/openwsn-fw/commits/develop
  - https://github.com/openwsn-berkeley/openvisualizer/commits/develop
  - https://openwsn.atlassian.net/secure/Dashboard.jspa#Activity-Stream/10206