

ETSI 6TiSCH #2 Plugtests

Informal Report

(Note Well: no official results yet)

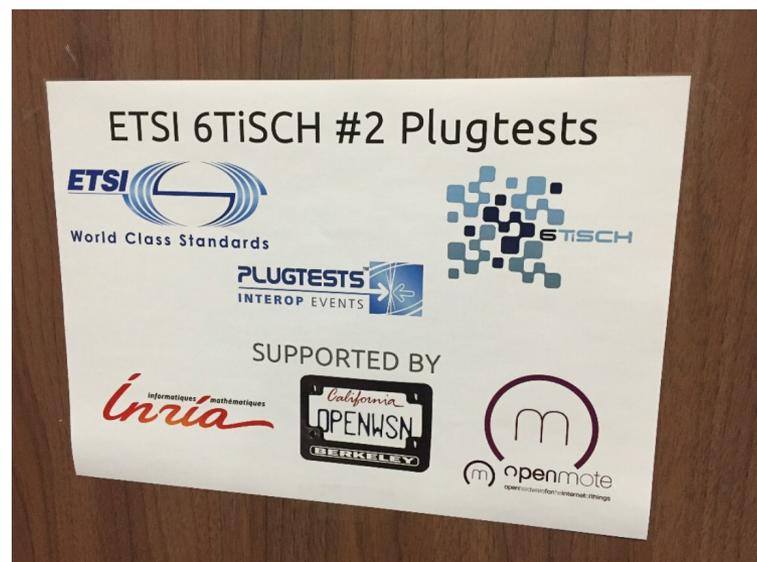


Administrivia

- **Organizers:**
 - ETSI (Miguel Angel Reina Ortega, Aurelie Sfez)
- **Supporters:**
 - Inria (host)
 - OpenWSN (golden device software)
 - OpenMote (golden device hardware)
- **Team of experts:**
 - Maria Rita Palattella (lead: Test Description)
 - Xavier Vilajosana (lead: Hardware)
 - Tengfei Chang (lead: Tools)
 - Thomas Watteyne (lead: coordination)

Logistics

- 2-4 Feb 2016
- Inria-Paris
- 14 companies
- 5 different implementations
- Under NDA



Scope

ETSI 6TiSCH #1 Plugtests

17-19 July 2015, Prague, CZ

ETSI 6TiSCH #2 Plugtests

2-4 Feb 2016, Paris, France

Minimal 6TiSCH configuration

draft-ietf-6tisch-minimal

- simpleTSCH schedule
- link-layer security
- RPL

6top Protocol (6P)

draft-wang-6tisch-6top-sublayer

6LoRH

draft-ietf-6lo-paging-dispatch

draft-ietf-6lo-routing-dispatch

Test Description

#14 tests, 4 classes of tests

1. SYNCH

- Synch to EB w/ default timeslot template
- Synch to EB w/out default timeslot template

2. RPL

- Join priority
- Rank computation

3. 6P

- ADD
- COUNT
- LIST
- DELETE
- CLEAR
- Timeout

4. 6LoRH

- source routing header correctly encoded as a 6LoRH Critical RH3
- RPL Information Option correctly encoded as a 6LoRH RPI
- IP in IP 6LoRH when packet travel inside RPL domain
- IP in IP 6LoRH when packet travel outside RPL domain

Test Description: an example

Test Number	5			
Test ID	TD_6TiSCH_6P_01			
Test Objective	Check a 6N can ADD a cell in the schedule according to draft-wang-6tisch-6top-sublayer-04			
Configuration	Star			
Applicability	SUT includes a PS to see the 6P packets on the air. To this purpose, GD/sniffer, or a vendor PS can be used.			
References	IEEE802.15.4e, draft-wang-6tisch-6top-sublayer-04			
Pre-test conditions	The DR sends EB periodically, every 10 sec [2]. All EB packets are sent on a single frequency. Power on DR. Wait until both 6N join the DR.			
Test sequence	Step	Type	Description	Result
	1	Stimulus	The 6N1 sends a 6P ADD request to the DR for 1 slot. The candidate list is {4,5}	
	2	IOP Check	The PS captures the sequence of request and response	
	3	IOC Check	Check the packet header captured by the sniffer has the same format defined in the draft-wang-6tisch-6top-sublayer-04 for both the request and the response	
	4	IOC Check	Check that the returned code for the operation is IANA_6TOP_RC_SUCCESS	
	5	Stimulus	The 6N2 sends a 6P ADD request to the DR for 1 slot. The candidate list is {4}	
	6	IOP Check	The PS captures the sequence of request and response	
	7	IOC Check	Check that the returned code for the operation is IANA_6TOP_RC_RESET	
IOP Verdict				

Test Scenarios

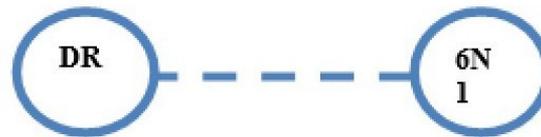


Figure 1 Single-hop scenario

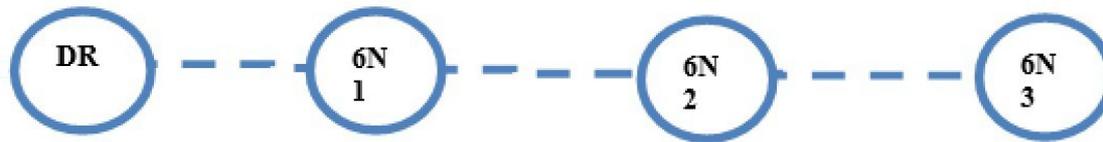
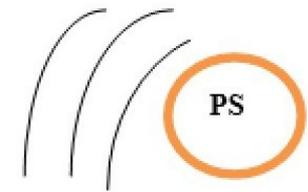


Figure 2 Multi-hop scenario

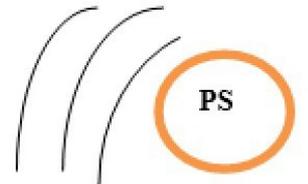
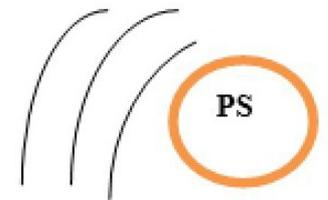
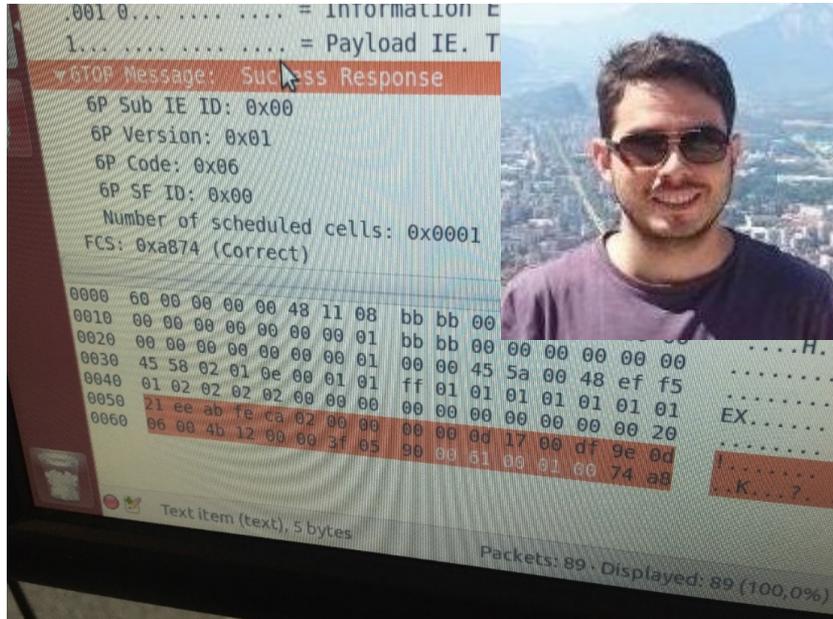


Figure 3 Star scenario



Tools



Wireshark dissector:

- 6top Protocol (6P), part of 6TiSCH
- 6LoRH, part of 6LoWPAN

Contributor: Jonathan Munoz (thanks!)



Golden device:

- Based on OpenWSN
- Adding commands to help testing

Contributor: Tengfei Chang (thanks!)

Agenda

6TiSCH 2 Plugtests Agenda - FEBRUARY 2016			
Time	Tuesday 02	Wednesday 03	Thursday 04
08:30 09:00	Registration & Set up	Room Opening	Room Opening
09:00 12:00		TEST SESSIONS	TEST SESSIONS
12:00 13:00		NETWORKING LUNCH	
13:00 14:00	Weclome Presentation	NETWORKING LUNCH	NETWORKING LUNCH
14:00 18:00	TEST SESSIONS	TEST SESSIONS	Tear Down
18:00 18:30	WRAP UP SESSION	WRAP UP SESSION	

Feedback to standardization bodies

- **to IETF 6TiSCH working group**

- first 6P working and inter-operating implementations!
- work in progress about e.g. 6P sequence number not integrated yet, will need to happen before next Plugtests

- **to IETF 6lo working group**

- first 6LoRH working and inter-operating implementations!
- 2 issues were opened and flagged as the result of this event:
 - behavior of 6LoWPAN is unclear with encapsulated IPHC (<https://trac.tools.ietf.org/wg/6lo/trac/ticket/16>)
 - whether or not it's a good idea to remove the addresses from the source routing header as the packet progresses through the network

H2020 F-Interop



- Goal** To develop and provide online (and remote) interoperability and performance test tools to support emerging technologies from research to standardization and market launch
- Duration** 36 months
- Dates** 1 November 2015 – 31 October 2018
- Consortium** 9 partners from 6 countries: Including 2 companies (EANTC, DG) , 2 universities (UPMC, UL), 4 public and private research centres (iMinds, MI, INRIA, DigiCat) and 1 standardization organisation (ETSI)

F-Interop and IETF 6TiSCH

- One of the target technologies: 6TiSCH
- Scope: from today face-to-face Interop events to tomorrow remote (online) Interop tests which take into account a diversity of end-user requirements and potential configurations
- Advertise F-Interop to IETF and promote adoption of test tools
- Preliminary F-Interop 6TiSCH test tool at IETF96 Berlin