



PRELIMINARY RESULTS OF 1ST COAP PLUGTEST

Sebastian Müller, Technical Coordinator, ETSI

- What is a Plugtest?
- Interoperability Test Procedure
- Reflection on CoAP Plugtest
- Participants
- Plugtest Results
- Conclusion

What is a Plugtests event?



- A test event organized and run by a neutral body
 - Scope, test infrastructure and test scenarios based on standard
 - Scheduling
 - Test Results and Feedback to Standards Development
- An opportunity for engineers
 - Evaluate the interoperability of their products
 - Validate their understanding of the base specification
 - Save time
- An opportunity for vendors
 - To demonstrate end 2 end interoperability to operators/end customers
 - Promote the technology and community
- An opportunity for Standards Development
 - Gaps, ambiguities, interpretations
 - A tool to validate and enhance the quality of standards

Interoperability Test Procedure



- Connect client and server over test network
- Check connectivity between devices
- Perform tests according to Plugtest Guide
 - Check if test runs to completion
 - Check results from an interoperability point of view:
Is the intended result visible at the application layer?
- Result determination and reporting
 - Result OK: run next test
 - Result NOK: check monitor tools to identify source of error
 - Report results in ETSI Test Reporting Tool

Reflection on the CoAP Plugtest (1/2)



- Jointly organized by ETSI, ProbelT, IPSO Alliance
- Hosted at IETF#83
- 2 day event
- Sponsored by EC
- Test specification produced by ETSI and ProbelT
 - Distributed 2 months prior to event
 - Total of 26 tests
- ETSI Tools
 - WIKI
 - Scheduling Tool
 - Test Reporting Tool
- IRISA tool – Passive Trace Validation
- BUPT tool – Lossy Gateway

Reflection on the CoAP Plugtest (2/2)



- Active involvement by all players in build-up to CoAP Plugtest through 3 conference calls and email reflector
 - Thanks to all participants for reviewing the test specification and helping to correct errors/ambiguities
- Test sessions for IOP assessment followed by selective wrap-up for main interop points of the day
- Demo of 6LowPAN Conformance Tests
- Good Community spirit
- Good industry participation
 - 15 companies with implementations
 - 4 companies as part of plugtest team
 - More than 50 people
- Important mix of technologies
 - 6 different embedded wireless platforms; TinyOS, Contiki, Custom OS; Java, C/C++, C#, Ruby, JavaScript

Participants



#	<i>Implementations</i>
1	Actility
2	Watteco
3	Eth Zurich
4	Hitachi
5	Huawei
6	Intecs
7	KoanLogic
8	Patavina
9	Sensinode
10	Uni Bremen
11	Uni Rostock
12	Rtx
13	Ibbt
14	Ferrara
15	

#	<i>Plugtest Team</i>
1	IRISA
2	BUPT
3	CATR
4	ETSI

Scope of Interoperability Tests



● CORE

- Get, Post , Put, Delete, Token, Uri Path/Query
- Lossy context

● LINK

● BLOCK

● OBSERVE

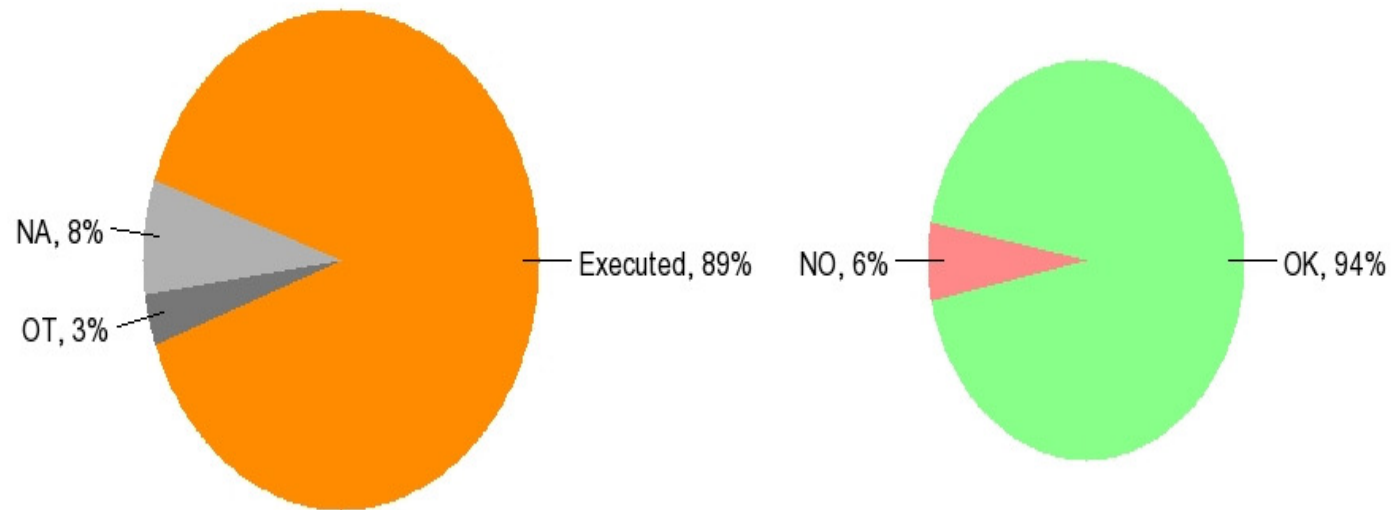
- Resource Observation
- Deregistration Detection



● Test Spec

- 27 tests
- Structured in optional/mandatory
- 16 CORE
- 2 LINK
- 4 BLOCK
- 5 OBSERVE

Test Results – Overview



Total Tests

Executed Tests

Analysis – Mandatory Tests



- More than 3000 tests executed
- More than 90 % of executed tests passed
 - High level of interoperability
- 8 % of the tests are not executed due to non implemented features
 - Mainly BLOCK and OBSERVE
- 3% of the tests not executed due to time limitation

Test Results – Per Group



Results per Group

Group	Interoperability			Not Executed		Totals	
	OK	NO		NA	OT	Run	Results
CORE	2632 (94.1%)	166 (5.9%)		136 (4.5%)	74 (2.5%)	2798 (93.0%)	3008
LINK	71 (92.2%)	6 (7.8%)		5 (6.1%)	0 (0.0%)	77 (93.9%)	82
BLOCK	97 (86.6%)	15 (13.4%)		40 (24.4%)	12 (7.3%)	112 (68.3%)	164
OBSERVE	90 (95.7%)	4 (4.3%)		78 (38.0%)	33 (16.1%)	94 (45.9%)	205

- Token Options (often implemented only partially)
- Block1 option (i.e, blockwise PUT/POST)
- Clients, having received an incoming packet , must use in their response the IP address to which the incoming packet has been addressed; Clients shall not change their source address in a response
- Suggestion: Client should not always use default port (src port == 5683) as source port for requests. Ephemeral port range should be used to make sure that hard coded addresses are not used

- Well prepared event
 - Participants were prepared as the test spec was delivered well in advance
 - Stable Test Spec (no errors reported during the plugtest)
 - Stable test infrastructure
 - Pre testing was very useful
- Everybody was able to execute against a fair number of other companies
- All tests defined could be executed in a single 1 hour session
 - An initial setup time of at least 1 hour would be beneficial
- Interest in conformance tests
- Plugtest enabled to resolve bugs and to achieve higher quality implementations
 - Some bugs were fixed in each implementation

Conclusion on the Results



- Implementations have been all compatible on the basic level
 - Sent data could be decoded and interpreted properly by receivers
 - Vast majority of equipment performed well
- Mature and prototype implementations exist
 - The difference between mature and prototype implementations is in the level of coverage of implemented features
 - When features are implemented, then high interoperability is observed
 - Conformance monitoring shows that more conformance testing is needed
- COAP base standards are mature
 - This applies to the parts of base standard that were covered in the plugtest
- This first plugtest is a success with regards to the number of participants and the test results
 - Vendors were mature enough to start with interoperability testing
 - This event is a clear signal to the community about the usefulness of testing

What is next?



- To organize another Plugtests event in Q4 2012
 - Scope and location to be defined
- To include in scope tests for
 - Proxy
 - Security DTLS
 - IPSO profile
 - Full set of options
 - Resource Directory
- To consider a slightly longer event
- More conformance sessions during the Plugtests event

- Plugtest web page, Mailing list
 - <http://www.etsi.eu/plugtests/coap/coap.htm>
- For any information contact plugtests@etsi.org