



T2TRG: Thing-to-Thing Research Group

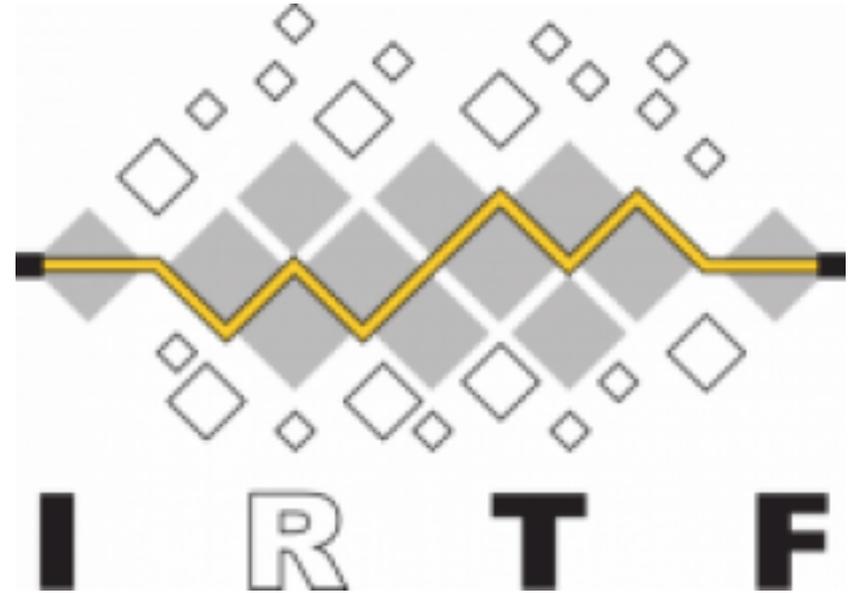
Thing-to-Thing RG (T2TRG) + W3C IG WoT joint meeting
Sophia Antipolis/Biot, FR, 2016-01-25..-28

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Note Well

- You may be recorded
- The IPR guidelines of the IETF apply:
see [**http://irtf.org/ipr**](http://irtf.org/ipr) for details.

IRTF



- Internet **Research** Task Force
- Sister organization of IETF (Internet **Engineering** Task Force)
- More long term perspective on hard, unsolved problems
- Reach out to researchers

Thing-to-Thing Research Group (T2TRG)

- Investigate open research issues in:
 - turning a true “Internet of Things” into reality,
 - an Internet where low-resource nodes (“Things”, “Constrained Nodes”) can communicate among themselves and with the wider Internet, in order to partake in permissionless innovation.
- Focus: issues that touch opportunities for standardization in the IETF
 - start at the adaptation layer connecting devices to IP, and
 - end at the application layer with architectures and APIs for communicating and making data and management functions (including security functions) available.

Relationship to IETF WGs

- These objectives will be achieved making use of a close involvement between the IETF community and the T2TRG.
- For the IETF, some RG documents may simplify the generation of (or even serve as) use case documents or other informational references.
- Close contact will be maintained with the IETF's IoT-related WGs and its IoT directorate.

Name, organization

- “Thing-to-Thing” is a homage to “end-to-end” RG
 - Not excluding device-to-cloud models
- Open membership
 - emulate DTNRG or ICNRG as a model

Previous Meetings

- @IETF92 (Dallas): Identified as main areas of interest: applied REST, Management protocols, Security
- @IETF93 (Prague): First joint meeting with W3C IG WoT; Focus on REST and Security
- @IETF94 (Yokohama): Second joint meeting with W3C IG WoT; continued on REST and Security

Halloween meeting

- 2015-10-31..-11-01, colocated with IETF94, adjacent to W3C IG WoT meeting in Sapporo (2015-10-29..-30)
- Joint meeting with W3C IG WoT:
 - (A) “REST as we know it” → “Beyond REST”
 - (B) Security and Lifecycle aspects in constrained nodes
- Focus on **common discussion**
- Do some RG administrative things at the end

T2TRG RESTful track (“A”)

Deliverables

- “RESTful Design for IoT Systems”
 - terminology, basic guidance & pointers
 - TBD: design patterns, resource design, etc.
 - draft-keranen-t2trg-rest-iot (1st version)
- “plugRESTs: lessons learned”
 - developing & testing hypertext-driven approach
 - draft-hartke-core-{apps,lighting} used as input

W3C & T2TRG work

- W3C Web of Things (WoT) IG, task forces: “Thing Description”, “Discovery”, “API and Protocols”
- T2TRG: “RESTful hyper-text driven apps”
- Sharing experiences and code
- Led to this week’s plugfest/REST

Topics Discussed

- Application state
- (Long running) actions with REST
- Links with values representations
- Partial changes for resources
- Conclusions from above: need more documented experience
 - but that's why we're here for

Learning from scenarios and plugRESTs

- Learn from the Big Web and apply Hypermedia/REST to the Internet of Things (IoT)
- What methods do transfer, where is IoT different: Learning by building and testing
- **<https://tools.ietf.org/html/draft-hartke-core-lighting-00>**: a simple application-level design applying principled RESTful hypermedia-driven style to a basic lighting scenario.
 - Gain experience in implementing strongly hypermedia-driven IoT applications
 - Document small but complete example for a hypermedia-driven IoT application
- Four parts:
 - Description – describe the attributes and capabilities of Things
 - Discovery – publish Thing descriptions and find other Things
 - Configuration – associate Things with each other (e.g., a switch with a lamp)
 - Operation – Things communicate and react to state changes
- You're welcome to join and participate in the first plugREST!

PlugREST 2016-01-25

- More details from Matthias Kovatsch later
- Interoperability between TZI and Siemens based on core-apps and core-lighting
- Additional implementation presentations by Michael Koster and David Janes

T2TRG security track (“B”)

W3C & T2TRG work

- W3C Web of Things (WoT) IG, interest group on “Security, Privacy and Resilience”
- Ongoing work on “Challenges”, “Requirements”, “Landscape of Means”
- Cross-pollination

Security considerations for the IoT

- starting from draft-garcia-core-security-06
- main contributors identified: Sandeep Kumar, Mohit Sethi, Jayaraghavendran K, Oliver Pfaff
- problems and guidelines (no completeness)
- cover lifecycle, ownership, stakeholders
- address recent IESG comments
- useful as a reference for security considerations sections in IETF standards

A Survey of Security Bootstrapping Approaches

- starting from draft-he-6lo-analysis-iot-sbootstrapping-00
- main contributors identified: Mohit Sethi, Carsten Bormann, Yizhou Li, Robert Cragie
- application security vs. network security
- per-solution characteristics
- Grouping of solutions? Identifiable categories?

Planned Next Meetings

- **Jan 25++: Joint meeting with W3C (France)**
- **Mar 15/16 (San Jose, adjacent to IAB workshop on semantic interoperability IOTSI)**
- (summary meeting at IETF95, Buenos Aires)
- (no meeting at Apr 12-14 W3C IG WoT)
- **July 16: @IETF96, Berlin (with RIOT summit)**
- (decide on fall/winter later)