RESTful IoT Work at T2TRG
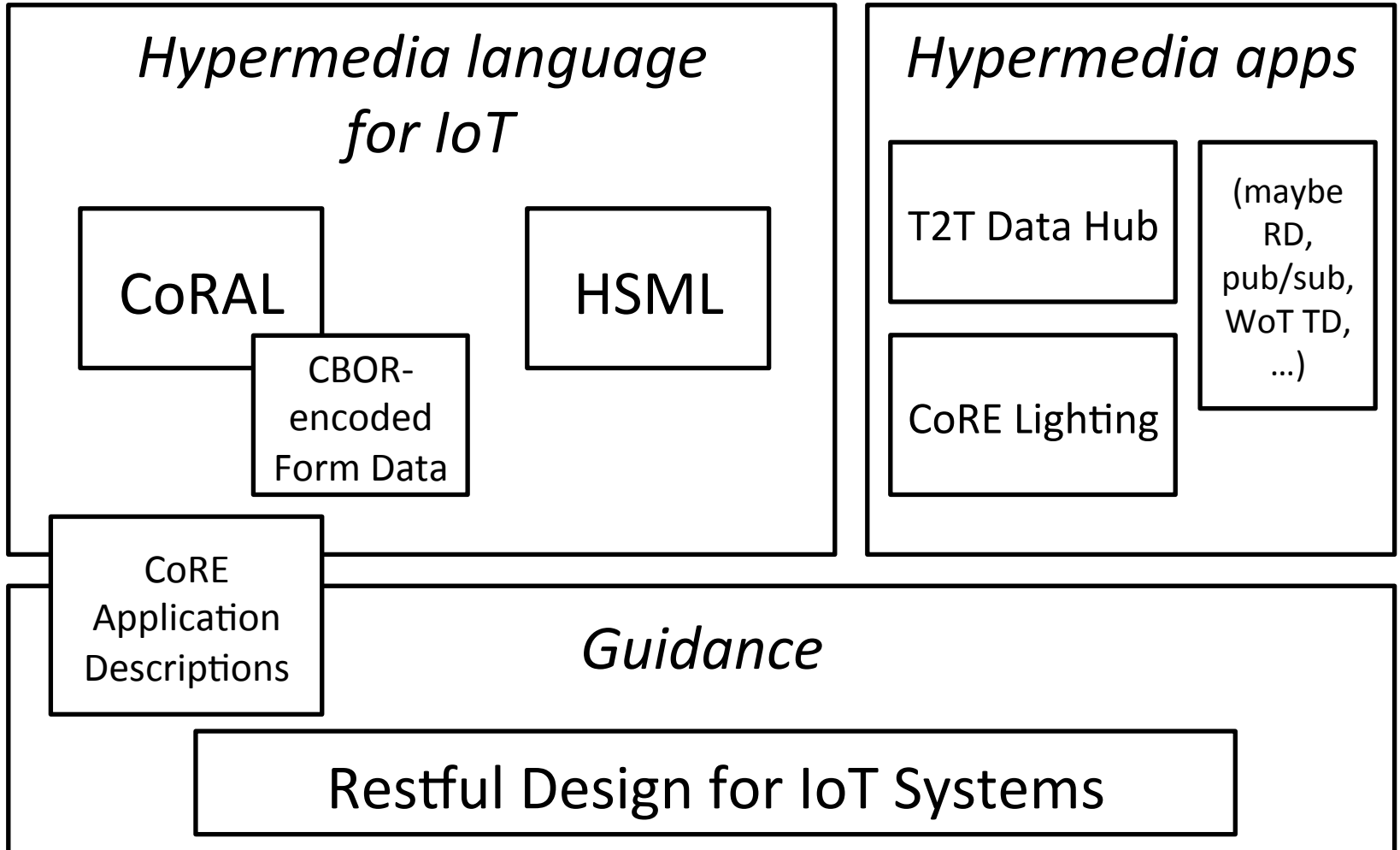
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Overview

Hypermedia language for IoT

CoRAL

CBOR-encoded Form Data

HSML

CoRE Application Descriptions

Hypermedia apps

T2T Data Hub

CoRE Lighting

(maybe RD, pub/sub, WoT TD, …)

Guidance

Restful Design for IoT Systems

RESTful Design for IoT Systems

- Guidance for designing IoT systems that follow the principles of the REST architectural style
- Collection of "basic" information and terminology that has been found useful
- Taking into account IoT characteristics
  - data formats, interaction patterns, and other mechanisms minimizing need for human interaction
  - enabling use of constrained devices and networks
- draft-keranen-t2trg-rest-iot

CoRE Application Descriptions

- A way to describe the APIs of constrained, RESTful, hypermedia-driven applications
  - URI schemes
  - media types
  - link relation types
  - form relation types
  - form field names
- draft-hartke-core-apps

Hypermedia Language for IoT

- How to express resources with hypermedia controls (e.g., links and forms) in constrained-thing friendly way

- "HTML for IoT"
  - But less focus on content, more on control
  - Also see work at W3C Web of Things groups: https://www.w3.org/WoT/

CoRAL: Constrained RESTful Application Language

- Efficient hypermedia representation format for links and forms

  - Compact representation with CBOR, defaults, numeric IDs. Often only few bytes needed.

- Reduce round trips with embedded representations

- Simple implementations

- draft-hartke-t2trg-coral & draft-hartke-t2trg-cbor-forms

HSML: Media Types for Machine Interaction

- CoRE link format + SenML => HSML Collections
  - JSON & CBOR representations
- Link annotation for application semantics
- draft-koster-t2trg-hsml

CoRAL & HSML

- Similarities
  - Collections of links and items
  - Forms to drive resource state updates
  - Interoperable data models
  - HSML can be encoded in CoRAL
- Differences
  - CoRAL: data model derived from HAL
  - HSML: CoRE Link-Format and SenML
  - CoRAL: media types to define application semantic vocabulary and data serialization
  - HSML: link annotation to embed application semantics

CoRAL & HSML: going forward

- Experimentation and evaluation through use case prototyping

- Eventually converge to single representation format and interaction model

Hypermedia Applications

- Core Lighting
  - Control smart objects in simple lighting scenario
  - Draft outdated; to be updated
- Thing-to-Thing Data Hub
  - RESTful, hypermedia driven web app
  - for publishing information to central location
  - Discover&Read Hub, CRUD+Observe & Find items
  - Evolvable API based on hypermedia
  - draft-hartke-t2trg-data-hub