EXI for Web of Things

Cutting edge aspects…
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Reasoning

• EXI achieves *generality, flexibility, and performance*,
  by unifying concepts from formal language theory and information theory into a single, relatively simple algorithm.

• The algorithm uses grammars to determine what is likely to occur at any given point.

• The generalized algorithm works for any language that can be described by a grammar.

• Moreover, EXI
  • achieves very efficient encodings
  • uses a small set of datatype representations
  • processors are simple and can be implemented on devices with limited capacity.

**Why not use *one* efficient serialization format across all Web technologies?**
EXI for JSON

Why would people want to use EXI for JSON
- very efficient representation compared to textual JSON
- more compact than other binary JSON formats
- EXI is proven technology in the XML stack
- (Re-)Use algorithms & datatypes for XML and JSON
  - One well-tested code base
  - reduce code footprint

EXI for JSON: https://www.w3.org/TR/exi-for-json/
## EXI for JSON

### Example Transformation

<table>
<thead>
<tr>
<th>JSON</th>
<th>EXI for JSON</th>
</tr>
</thead>
<tbody>
<tr>
<td>{</td>
<td>&lt;map&gt;</td>
</tr>
<tr>
<td>&quot;number&quot;: 123,</td>
<td>&lt;number key=&quot;number&quot;&gt;123&lt;/number&gt;</td>
</tr>
<tr>
<td>&quot;string&quot;: &quot;s1&quot;</td>
<td>&lt;string key=&quot;string&quot;&gt;s1&lt;/string&gt;</td>
</tr>
<tr>
<td>}</td>
<td>&lt;/map&gt;</td>
</tr>
</tbody>
</table>
EXI for JSON

JSON-LD Thing Description - Measurements

Samples taken from https://github.com/w3c/wot/tree/master/TF-TD/TF%20Samples
Extended String

EXI Strings – Status quo
- EXI uses a string table to assign "compact identifiers" to string values
- String values in the string table are represented using the associated compact identifier rather than encoding the entire "string literal"
- The value string table is initially empty

Extension - Shared Strings
- Pre-populate known strings e.g., JSON-LD context or JSON Schema
- Grammar strings

Extension - Split String
- Splitting strings might increase likelihood of string table hits e.g., RDFa

```xml
<rdf:Description
    rdf:about="http://www.recshop.fake/cd/Empire Burlesque">
    ...
</rdf:Description>
```
EXI – Stay tuned

Web: https://www.w3.org/XML/EXI/
Mailinglist: public-exi@w3.org

EXI Playground:

- http://exificent.github.io/javascript/demo/

- EXI for JSON
  http://exificent.github.io/javascript/demo/processJSON.html

- EXI for JSON (with shared strings)
  http://exificent.github.io/javascript/demo/processJSON.html?SharedStrings=true
Thank you!

Any questions / comments?

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