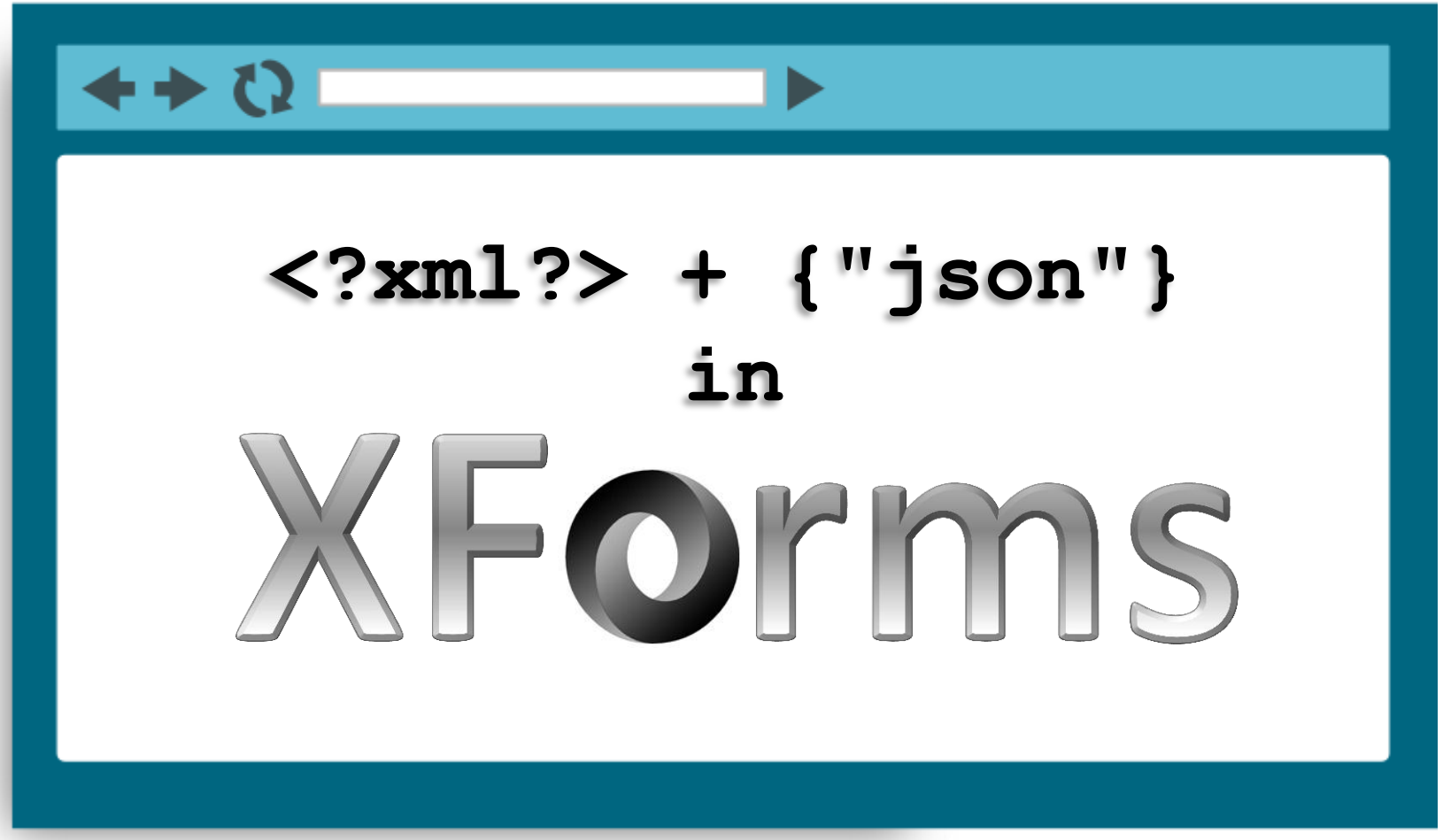

<?xml?> + {"json"}
in
XForms

agenceXML

- Products & Services:
  - XSLTForms, tXs, html2xml, …
  - Web Apps, Support & Extensions
  - Trainings
- Customers:

- Organizations/Companies just using/looking at?

…

XForms

Summary

- XForms Context
- JSON Objects Internal Storage In Browsers
- JSONP Support
- The Wikipedia Search Demo

XForms Context

- MVC Design
- XPath in XForms
- Server Exchanges
- JSON vs. XML for browsers
- Other Data Formats

XForms Context

MVC Design

- models: instances, bindings, submissions
- controls: input, output, upload, range, trigger,…
- events: xforms-value-changed, ev:DOMActivate,…
- actions: dispatch, send, refresh,…

XForms Context

XPath in XForms

- XForms 1.1: XPath 1.0 + extra functions
  (if statement, encryption, dates, credit cards,…)
- Used for nodeset association, calculations,
- Evaluation according to current context
  (document element by default)
- Dependencies to be maintained for performance at refresh

XForms Context

Server Exchanges

- XRX with Native XML Databases but not only
- AJAX-based exchanges
- Only XML serialization and flat GET parameters list in XForms 1.1

XForms Context

JSON vs. XML for browsers

- Lighter: no namespace, no element vs. attribute
- Shorter: minimal closing tags (})
- Richer: names, arrays and datatypes
- Natively evaluated and stored by Javascript

- Query support???

XForms Context

Other Data Formats

- vCard
- CSV with or without titles
- Formatted log files
- …

- Efficient XML Interchange

XForms

JSON Objects Internal Storage

- Constraints
- Elements, Attributes and Namespaces
- Extra Document Element
- JSON Names
- JSON Datatypes
- JSON Named Arrays
- JSON Anonymous Arrays
- XPath Engine Proposed Enhancements

XForms

JSON Objects Internal Storage

Constraints

- Reversibility:
  from JSON to XML and back
- XPath Full Support:
  - XPath extension functions
  - Minimal number of extra elements
  - Array [] notation almost preserved
- XML Schema Conformance:
  - xsi:type
  - xsi:nil
  - xsd:maxOccurs

XForms

JSON Objects Internal Storage

Elements, Attributes and Namespaces

General Principles:

- JSON Values:
  Elements within the empty namespace
- Metadata (datatypes, structures):
  Attributes within a specific namespace
- JSON Structures (when required):
  Elements within a specific namespace

JSON Objects Internal Storage

Extra Document Element

Proposed Rule #1:

Add a Document Element for each JSON object such as **exml:anonymous**.

XForms

JSON Objects Internal Storage

Extra Document Element

```
{
  a: "stringA",
  b: {
       c: "stringC",
       d: "stringD"
     }
}
```

```
<exml:anonymous>
  <a>stringA</a>
  <b>
    <c>stringC</c>
    <d>stringD</d>
  </b>
</exml:anonymous>
```

```
"a"    equals  'stringA'
"b/c"  equals  'stringC'
"b/d"  equals  'stringD'
```

JSON Objects Internal Storage

JSON Names

Proposed Rule #2:

For each JSON name which cannot be used as an XML name, create an element in the empty namespace with a name such as "____" and add an attribute such as **exml:fullname**.

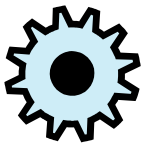
Create two new XPath functions: **fullname()** and **local-fullname()**.

JSON Objects Internal Storage

JSON Names

```
{
 "a & b": "A+B",
 "déjà": "already",
 "____":
   "underscores"
}
```

```
<exml:anonymous>
  <____ exml:fullname="a &amp;amp; b">A+B</____>
  <____ exml:fullname="déjà">already</____>
  <____ exml:fullname="____">underscores</____>
</exml:anonymous>
```



`"*[fullname() = 'a &amp; b']"`	equals	`'A+B'`
`"local-fullname(*[1])"`	equals	`'a & b'`
`"*[fullname() = 'déjà']"`	equals	`'already'`
`"local-fullname(*[2])"`	equals	`'déjà'`
`"____[fullname() = '____']"`	equals	`'underscores'`

XForms

JSON Objects Internal Storage

JSON Datatypes

Proposed Rule #3:

For each Javascript datatype, convert data into the corresponding XSD datatype and add an **xsi:type** attribute.

- JS number becomes XSD double.
- JS boolean becomes XSD boolean.
- JS Date becomes XSD dateTime.

JSON Objects Internal Storage

JSON Datatypes

```
{
  a: "string"+"A",
  b: 42,
  c: new Date(2011,3,26),
  d: true
}
```

```
<exml:anonymous>
  <a>stringA</a>
  <b xsi:type="xsd:double">42</b>
  <c xsi:type="xsd:dateTime">2011-03-26T00:00:00Z</c>
  <d xsi:type="xsd:boolean">true</d>
</exml:anonymous>
```

XForms

JSON Objects Internal Storage

JSON Named Arrays

Proposed Rule #4:

Iterate an element for each named array item and add an attribute such as **exsi:maxOccurs** to indicate it is an array item.

Add an attribute such as **xsi:nil** to distinguish an empty array from an empty element.

Create three new XPath functions: **is-array(*node*)**, **is-non-empty-array(*node*)** and **array-length(*node*)**.

XForms

JSON Objects Internal Storage

JSON Named Arrays

```
{
 a:["stringA",
       42],
 b:[],
 c:[""]
}
```

```
<exml:anonymous>
   <a exsi:maxOccurs="unbounded">stringA</a>
   <a exsi:maxOccurs="unbounded"
      xsi:type="xsd:double">42</a>
   <b exsi:maxOccurs="unbounded" xsi:nil="true"/>
   <c exsi:maxOccurs="unbounded"/>
</exml:anonymous>
```

"is-array(a)"	equals	true()
"a[1]"	equals	'stringA'
"a[2]"	equals	'42'
"array-length(b)"	equals	0
"c[1]"	equals	''

XForms

JSON Objects Internal Storage

JSON Anonymous Arrays

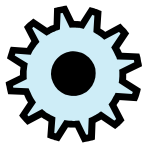
Proposed Rule #5:

For each anonymous array item, add an extra element such as **exml:anonymous** with an attribute such as **exsi:maxOccurs** to indicate it is an array item.

JSON Objects Internal Storage

JSON Anonymous Arrays

```
[
 ["stringA",
   42],
 []
]
```



```
"*[1]/*[2]"          equals '42'
"is-array(*[2])"     equals true()
```

```
<exml:anonymous>
 <exml:anonymous exsi:maxOccurs="unbounded">
  <exml:anonymous
    exsi:maxOccurs="unbounded">stringA</exml:anonymous>
  <exml:anonymous
    exsi:maxOccurs="unbounded"
    xsi:type="xsd:double">42</exml:anonymous>
 </exml:anonymous>
 <exml:anonymous exsi:maxOccurs="unbounded">
  <exml:anonymous exsi:maxOccurs="unbounded" xsi:nil="true"/>
 </exml:anonymous>
</exml:anonymous>
```

XForms

JSON Objects Internal Storage

XPath Engine Proposed Enhancements

- ` (backquote) to delimit names
- **name()** and **local-name()** to support all names
- **name()** and **local-name()** to return the empty string for **exml:anonymous**
- Instead of * for **exml:anonymous**:
  - **/exml:anonymous/** just written **/** ?
  - **exml:anonymous** written `` ?
  - **exml:anonymous[…]** written **[…]** ?

XForms

JSONP Support

- Request Submission
- Response Processing

XForms

JSONP Support

Request Submission

- Just construct a **script** element with an **src** attribute containing request parameters + the name of the Javascript callback function
- No cross-domain limitation!

XForms

JSONP Support

Response Processing

- The generated script contains the call to the callback function with the JSON response as parameter
- The callback function has to convert the JSON response into an XML instance

XForms

The Wikipedia Search Demo

http://en.wikipedia.org/w/api.php?
action=opensearch&search=prague

```
["prague",
 ["Prague",
  "Prague Spring",
  "Prague Conservatory",
  "Prague Ruzyn\u011b Airport",
  "Prague University",
  "Prague Castle",
  "Prague Metro",
  "Prague-East District",
  "Prague-West District",
  "Prague Offensive"]]
```

WIKIPEDIA

The Wikipedia Search Demo

- Two instances:

```
<xf:instance id="isearch"
mediatype="application/json">
  {
   action: "opensearch",
   format: "json",
   search: ""
  }
</xf:instance>
```

```
<xf:instance id="iresults"
mediatype="application/json">
   []
</xf:instance>
```

- One submission:

```
<xf:submission method="get" replace="instance"
 instance="iresults" separator="&amp;" validate="false"
 action="http://en.wikipedia.org/w/api.php"/>
```

- One constraint:

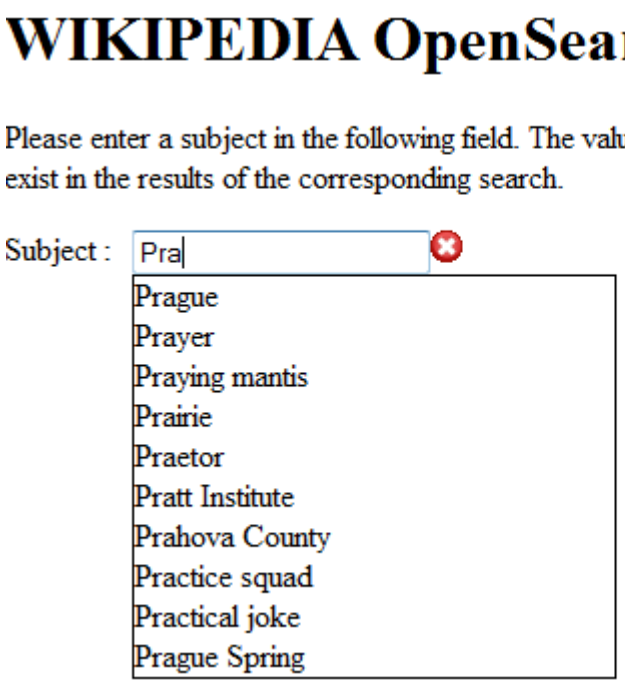
```
<xf:bind nodeset="search"
    constraint="instance('iresults')/*[2]/*[upper-case(.) =
                upper-case(current())]"/>
```

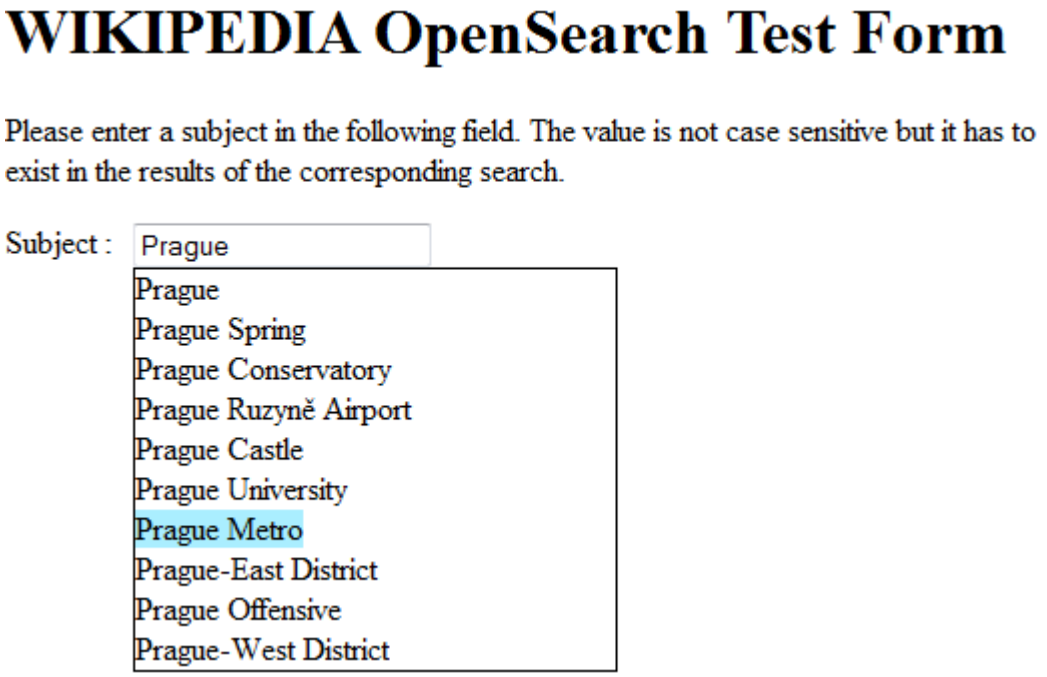
XForms

The Wikipedia Search Demo

```
<xf:input id="search" ref="search" incremental="true" delay="500">
 <xf:label>Subject: </xf:label>
 <xf:send ev:event="xforms-value-changed"/>
 <xf:toggle ev:event="DOMFocusIn" case="show-autocompletion" />
</xf:input>
<xf:switch>
 <xf:case id="show-autocompletion">
  <xf:repeat id="results" nodeset="instance('iresults')/*[2]/*[
                          is-non-empty-array() and . != '&#x300;']">
   <xf:trigger appearance="minimal">
    <xf:label><xf:output value="."/></xf:label>
    <xf:action ev:event="DOMActivate">
     <xf:setvalue ref="instance('isearch')/search"
                  value="current()" />
     <xf:toggle case="hide-autocompletion" />
    </xf:action>
   </xf:trigger>
  </xf:repeat>
 </xf:case>
 <xf:case id="hide-autocompletion" />
</xf:switch>
```

The Wikipedia Search Demo





XForms

Conclusion

- XForms instances written in JSON
- Intuitive XPath for JSON
- Simple JSONP use within XForms

- XML+XPath extensions to consider?