

Querying and Transforming JSON Documents

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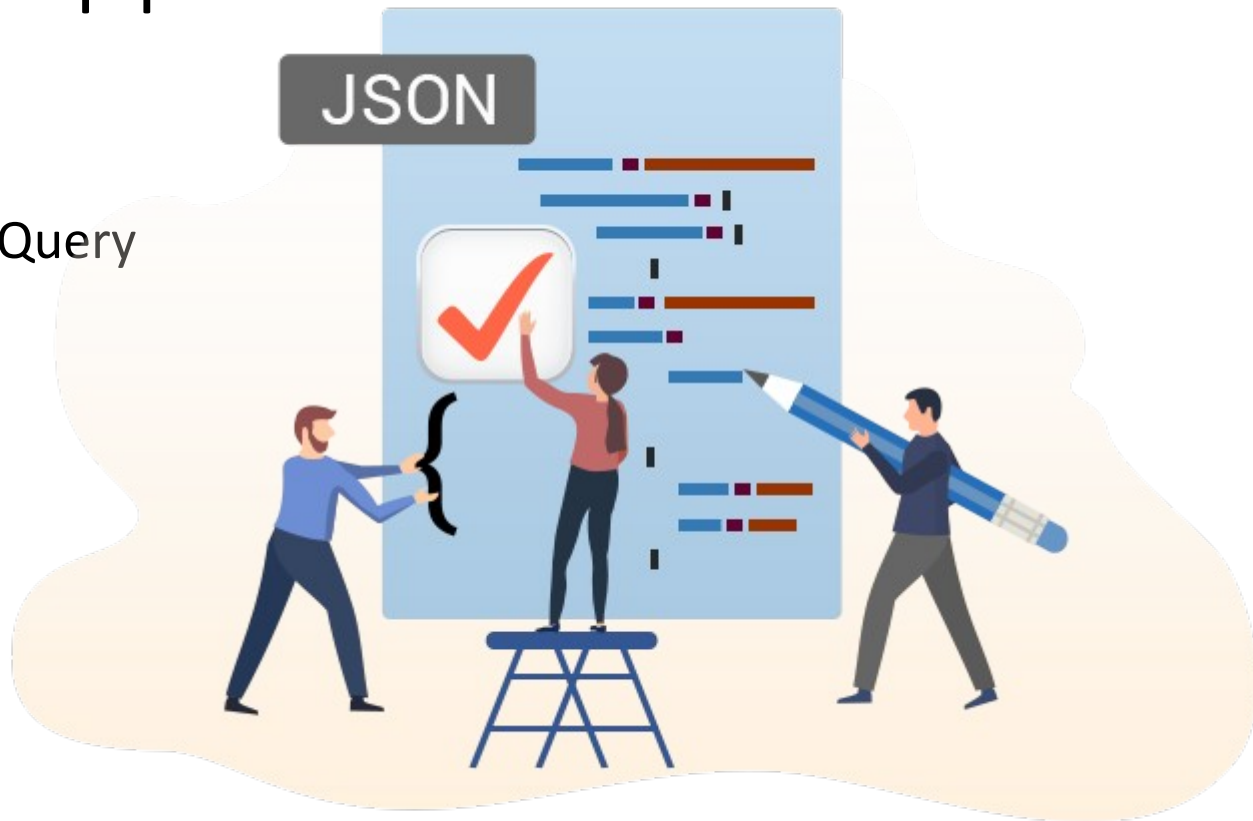
Agenda

- JSON Support in Oxygen
- JSON Transformation with XSLT
- JSON Querying with XQuery
- Batch Processing
- XPath for JSON



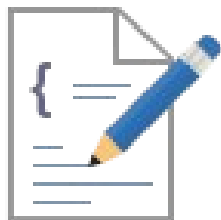
Oxygen JSON Support

- JSON Editor
- JSON Validation
- JSON Transformation and Query
- JSON Conversion Tools
- JSON Schema



Editing JSON

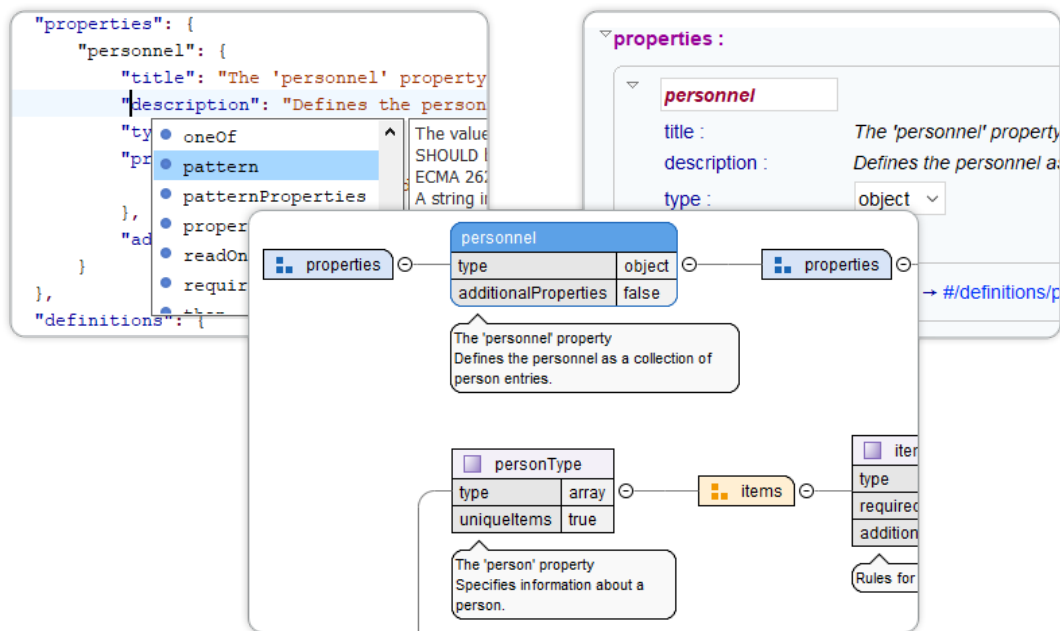
- JSON Text, Grid, Author Editing Mode
- JSON Outline View
- Validation and Content Completion Assistant based on JSON Schema



JSON Schema Editor

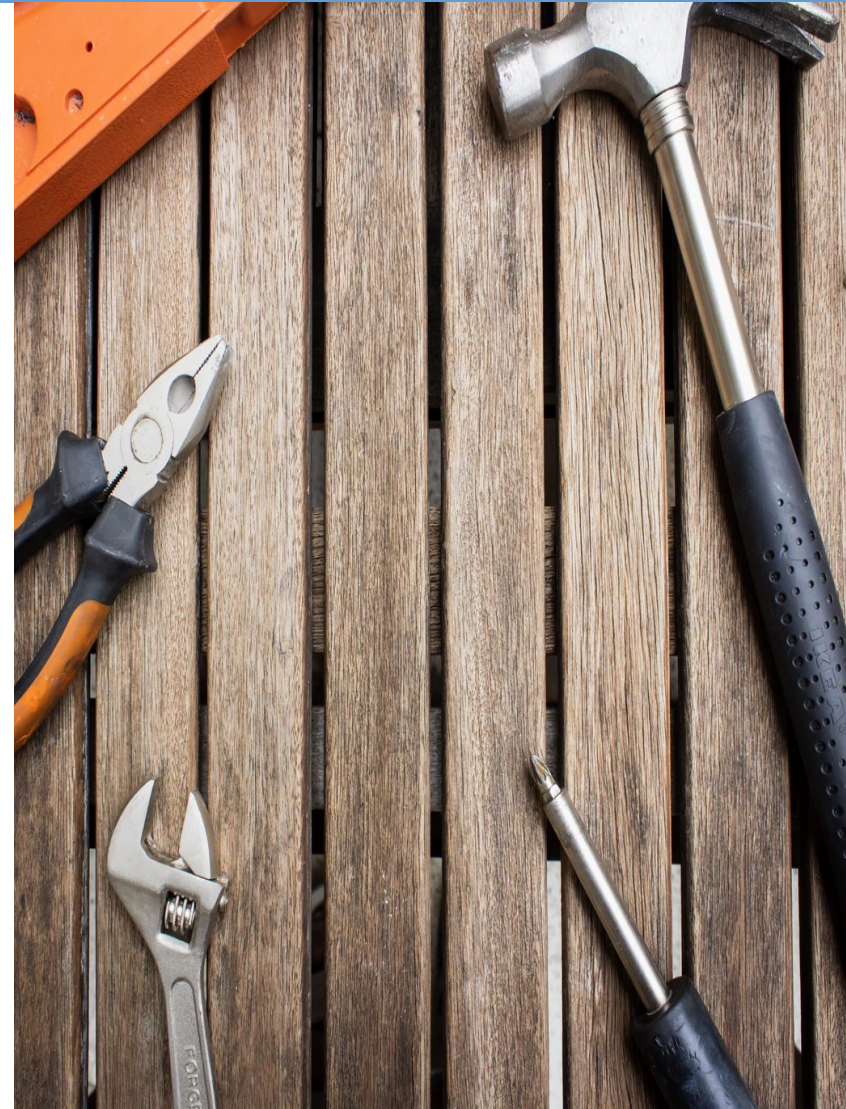
Design, develop, and edit JSON Schemas in:

- Text Editing Mode
- Author Editing Mode
- Schema Design Mode



JSON Tools

- Convert between [JSON and XML](#)
- Convert between [JSON and YAML](#)
- Generate [sample JSON files](#) from JSON Schema
- [Generate JSON Schema](#) from a JSON instance
- [XSD to JSON Schema](#) converter
- Convert JSON Schema to [latest versions](#) (2020-12, 2019-09)



OpenAPI/AsyncAPI Documents

- Can be written in JSON or YAML
- Describe the inputs and outputs of an API
- Include information such as:
 - where the API is hosted
 - what authorization is required to access it
 - details for consumers and producers



Querying and Transforming JSON

- Transform JSON using XSLT
- Transform JSON using XQuery
- XPath Support

personal.json x

```

1 {
2   "$schema": "personal-schema.
3   "personnel": {
4     "person": [
5       {
6         "id": "Big.Boss",
7         "name": {
8           "family": "Bo
9           "given": "Big
10        },
            
```

personal-jsonDoc.xsl x

```

#comment
1 <?xml version="1.0" encoding="U
2 <!--
3   Stylesheet used to process
4   and generate an HTML output
5 -->
6 <xsl:stylesheet version="3.0" x
7   xmlns:xs="http://www.w3.org
8   xmlns:map="http://www.w3.or
9   xmlns:array="http://www.w3.
            
```

Name	Email	Link
Boss Big	chief@oxygenxml.com	one.worker two.worker three.worker four.wo
orker One	one@oxygenxml.com	Big.Boss
orker Two	two@oxygenxml.com	Big.Boss

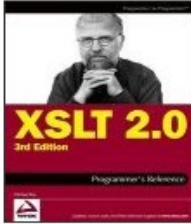


Demo- Generate HTML

- Create a stylesheet to generate an HTML file



```
{
  "books": [
    {
      "technology": "XSL",
      "targeturi": "bookTargetURI",
      "title": "XSLT 2.0 Programmer's Reference",
      "author": "Michael Kay",
      "image": {
        "description": "XSLT 2.0",
        "src": "img/XSLT_2_0.jpg"
      },
      "paperback": "955 pages",
      "publisher": "Wrox; 3 edition (August 9, 2004)",
      "isbn": "0764",
      "description": "XSLT 2.0 Programmer's Reference,
3rd Edition, is the authoritative reference guide to the
language."
    }
  ]
}
```

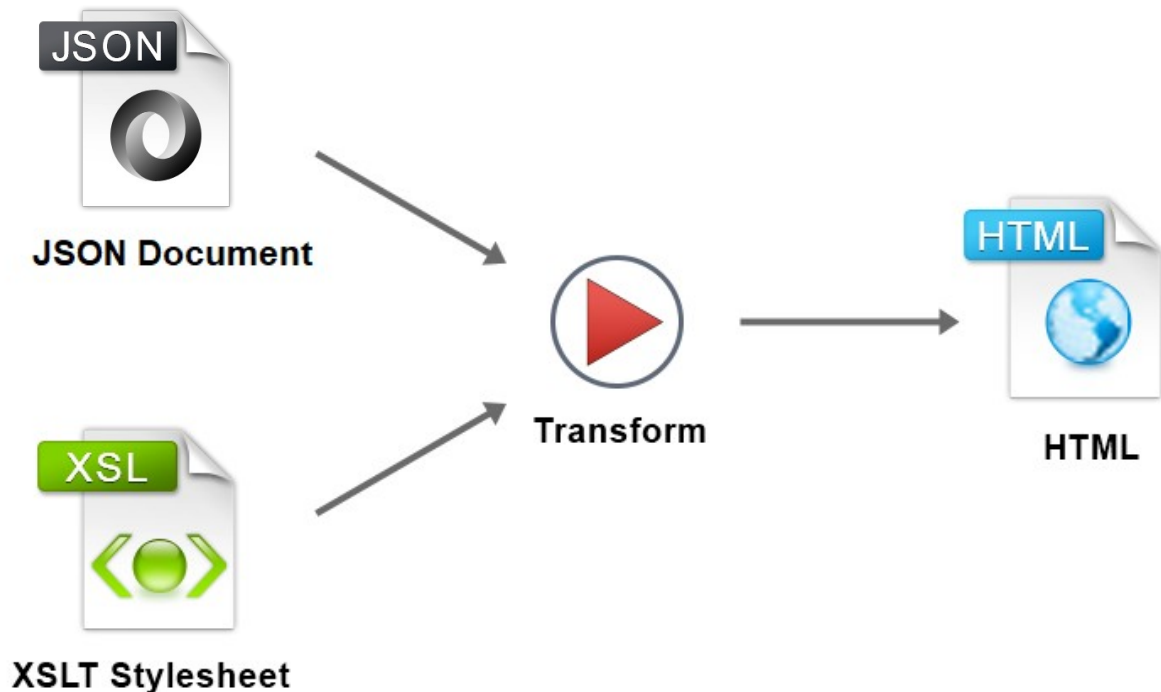


[XSLT 2.0 Programmer's Reference](#)
by Michael Kay
Paperback: 955 pages | Publisher: Wrox | ISBN: 0764

XSLT 2.0 Programmer's Reference, 3rd Edition, is the authoritative reference guide to the language.

Demo – Associate Scenario

- Associate the JSON with the XSL and generate an output



Batch XSLT Transformation

- Process multiple JSON documents at once
- Select the files to be transformed from project

Transform JSON using XQuery

- JSON Transformation with XQuery - This scenario is useful if you want to develop a JSON document and the XQuery document is in its final form
- XQuery Transformation on JSON - This scenario is useful if you want to develop an XQuery document and the JSON document is in its final form
- Transforming Multiple JSON Documents at Once

XPath 3.1 Functions

- `json-to-xml()` - convert from JSON to XML
- `xml-to-json()` - convert from XML to JSON
- `parse-json()` - convert from lexical JSON to the corresponding structure of maps and arrays
- `json-doc()` - does the same thing, but taking the input from a file rather than from a string
- Built-in Document Templates
 - XSLT Stylesheet for JSON – uses `json-doc()` function
 - XSLT Stylesheet for JSON to XML – uses `json-to-xml()` function

Convert between JSON and XML

- `xml-to-json()` - convert from XML to JSON
- `json-to-xml()` - convert from JSON to XML

```
{
  "id": "one.worker",
  "name": {
    "family": "Worker",
    "given": "One"
  },
  "email": "one@oxygenxml.com",
  "link": {"manager": "Big.Boss"}
}
```

```
<map>
  <string key="id">one.worker</string>
  <map key="name">
    <string key="family">Worker</string>
    <string key="given">One</string>
  </map>
  <string key="email">one@oxygenxml.com</string>
  <map key="link">
    <string key="manager">Big.Boss</string>
  </map>
</map>
```

Convert between JSON and XML

- `org.json.XML:toJSONObject()` - convert from XML to JSON
- `org.json.XML:toString(JSONObject())` - convert from JSON to XML

```
{
  "person": {
    "id": "one.worker",
    "name": {
      "family": "Worker",
      "given": "One"
    },
    "email": "one@oxygenxml.com",
    "link": {"manager": "Big.Boss"}
  }
}
```

```
<person>
  <id>one.worker</id>
  <name>
    <family>Worker</family>
    <given>One</given>
  </name>
  <email>one@oxygenxml.com</email>
  <link>
    <manager>Big.Boss</manager>
  </link>
</person>
```

Querying JSON Documents with XQuery

- XQuery Builder view
 - Saxon-HE/PE/EE XQuery JSON

The screenshot displays the Oxygen XML Editor interface. On the left, a JSON document named 'personal.json' is shown with a tree view. The JSON content is as follows:

```
1 {
2   "$schema": "personal-schema.json",
3   "personnel": {
4     "person": [
5       {
6
7         "id": "Big Boss",
8         "name": {
9           "family": "Boss",
10          "given": "Big"
11        }
12      }
13    ]
14  }
15 }
```

On the right, the 'XPath/XQuery Builder' window is open, showing XQuery code for Saxon-HE XQuery 9.8.0.12. The scope is set to 'Current File' and 'personal.json'. The XQuery code is:

```
3 declare namespace array =
4   "http://www.w3.org/2005/xpath-functions/array";
5 declare variable $document-uri as xs:string :=
6   "../personal.json";
7 declare variable $document :=
8   json-doc($document-uri);
9 declare variable $manager as xs:string := "Big.Boss";
```

At the bottom, a table shows the XQuery results:

(N)	1. person	1 <?xml version="1.0" encoding="UTF-8"?>
(N)	2. person	2 <person id="one.worker">
(N)	3. person	3 <name>One Worker</name>
		4 </person>

XPath Support

- XPath Toolbar and XPath Builder View
- Content Completion
- XPath Over Multiple Files

XPath 2.0 `//person[link/manager/text()='Big.Boss']/name/given`

personal.json

```
7      "id": "Big.Boss",
8      "name": {
9        "family": "Boss",
10     "given": "Big"
11     },
12     "email": "chief@oxygenxml.com",
13     "link": {
```

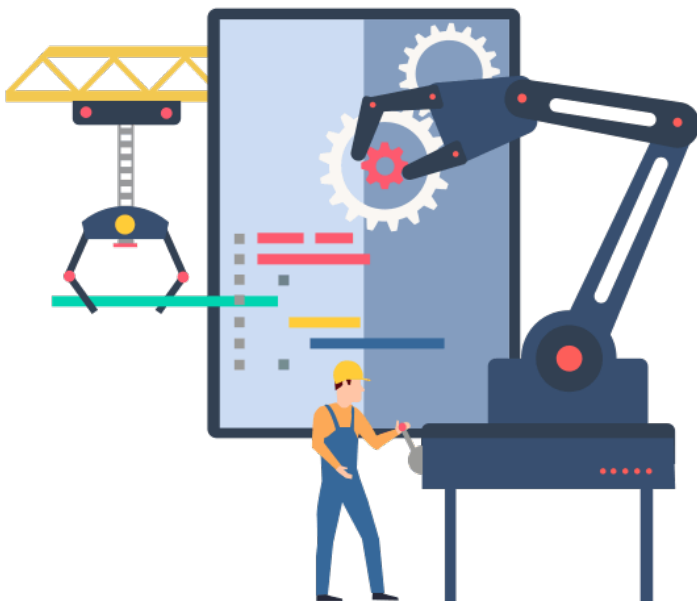
Text Grid

Description - 5 items	XPath location
One	<code>/JSON[1]/personnel[1]/person[2]/name[1]/given[1]</code>
Two	<code>/JSON[1]/personnel[1]/person[3]/name[1]/given[1]</code>
Three	<code>/JSON[1]/personnel[1]/person[4]/name[1]/given[1]</code>
Four	<code>/JSON[1]/personnel[1]/person[5]/name[1]/given[1]</code>

Transform using Oxygen Script

- Run Transformation Scenarios

```
sh scripts/transform.sh -i inputFile -sn scenarioName [-s scenariosFile] [-v]
```



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Conclusion

- Transform JSON with XSLT/XQuery using transformation scenarios
- Process JSON using XPath 3.1 functions
- Query JSON using XQuery Builder
- Run XPath over JSON documents
- Run transformation from script



Future Plans

- Support for the lookup operator ("?") in the XPath Toolbar.
- Content completion support in XSLT for JSON properties.
- XSLT/XQuery input view support for JSON.
- *feedback is welcome*



Question: What future developments would you like to see?

- Support for the lookup operator ("?") in the XPath Toolbar.
- Content completion support in XSLT for JSON properties.
- XSLT/XQuery input view support for JSON.
- Other (use the question panel)



Resources

- oxygenxml.com/doc/ug-developer/topics/json-transforming.html
- oxygenxml.com/xml_developer/json_transformation.html
- oxygenxml.com/json_editor/videos.html
- [w3.org/TR/xpath-functions-31/#func-json-to-xml](https://www.w3.org/TR/xpath-functions-31/#func-json-to-xml)



Video Demos

- oxygenxml.com/demo/json_schema_palette.html
- oxygenxml.com/demo/introducing_the_json_schema_design.html
- oxygenxml.com/demo/json_author.html
- oxygenxml.com/demo/json_tools.html
- oxygenxml.com/demo/json_validation.html
- oxygenxml.com/demo/json_editing.html
- oxygenxml.com/demo/json_query.html



Questions?

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