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Java API for JSON

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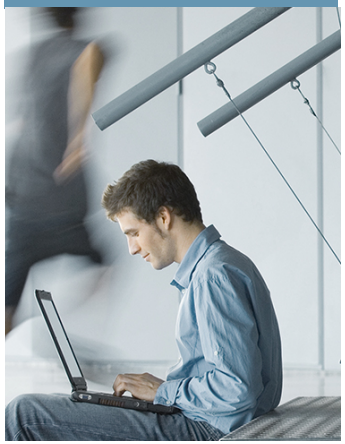
Program Agenda

- Overview
- JAX-RS Usage
- Standardization
- API



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Overview

JSON

- JSON is a light-weight data exchange format
  - Easy for humans/machines to read and write
  - For e.g.

```
{"name":"Bob", "age":20, "phone":["276 1234", "123 4567"]}
```

- JSON is used by popular web sites in their RESTful web services
  - Facebook, Twitter, Amazon, …
  - Twitter Streaming API discontinues XML

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Overview

JSON usages

- Policy in Amazon SQS

```
{
    ...
    "Statement": {
        "Effect": "Allow",
        "Principal": { "AWS": "123456789012” },
        "Action": "sqs:SendMessage",
        "Resource": "/987654321098/queue1"
    }
}
```


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Overview

JSON usages

- Followers in Twitter API

```
{
    "previous_cursor": 0,
    "ids": [143206502, 143201767, 777925],
    "previous_cursor_str": "0",
    ...
}
```


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JAX-RS

XML Usage

- JAX-RS applications handle XML using JAXP API

```
@Produces("application/xml")
public Source getBook(String id) {
    return new StreamSource(…);
}
```


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JAX-RS

XML Usage

- JAX-RS applications handle XML using JAXB API

```
@Produces("application/xml")
public Book getBook(String id) {
    return new Book(…);
}
```


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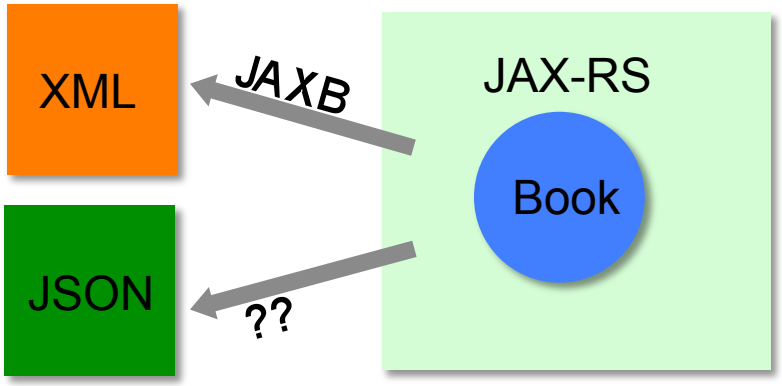
JAX-RS

DataBinding

- JAX-RS content negotiation

```
@Produces({"application/xml", "application/json"})
public Book getBook(String id) {
    return new Book();
}
```



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JAX-RS

JSON Solutions & Limitations

- A custom MessageBodyWriter converts Book object to JSON
  - Book is of type JSONObject (For e.g. json.org's API)
  - JAXB → StAX → JSON (For e.g. using jettison)
  - POJO/JAXB → JSON (For e.g. using jackson, eclipseLink etc.)
- No standard API
- Some solutions have technical limitations
- Applications/Frameworks need to bundle the libraries

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Standard API

Advantages

- Application can use standard types
- Leaner, portable applications

Standard API

Contents

- Streaming API to produce/consume JSON
  - Similar to StAX API in XML world
- Object model API to represent JSON
  - Similar to DOM API in XML world
- Data binding : JSON text <-> Java Objects

Standardization

JSR

- Perhaps two JSRs: Processing/Parsing, Binding
  - Similar to JAXP and JAXB
  - Close collaboration between the two
  - Parsing JSR align with Java EE 7 schedules
- Can learn from existing implementations
  - json.org/java, google-gson, Jackson, JavaFx, …
- Processing/Parsing JSR Supporters
  - Tatu Saloranta(Jackson), Doug Crockford(json.org)

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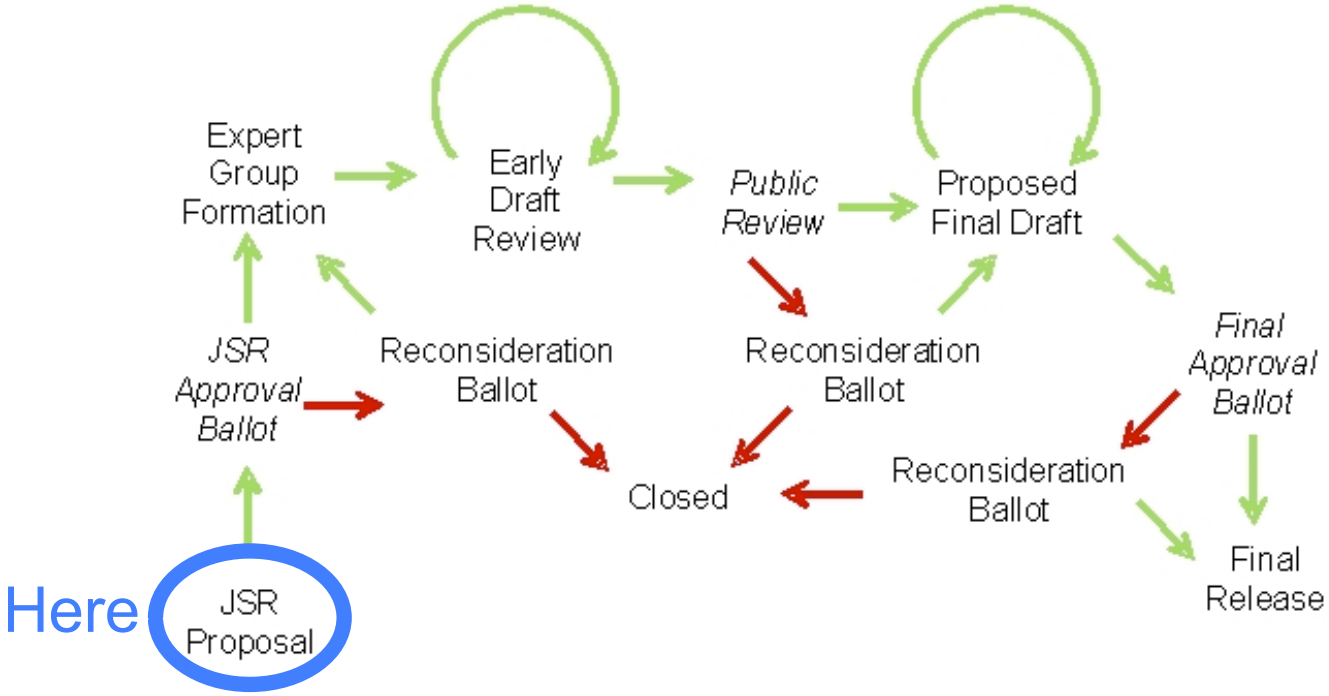
Standardization

JSR State Diagram



Source: http://blogs.oracle.com/darcy/entry/pictorial_jcp

Parsing API

JSR

- My experimental API
  - Based visitor pattern (similar to ASM, JSR 269 API, …)
  - Not reviewed internally also
  - Still evolving
  - Of course, EG may have a different take !

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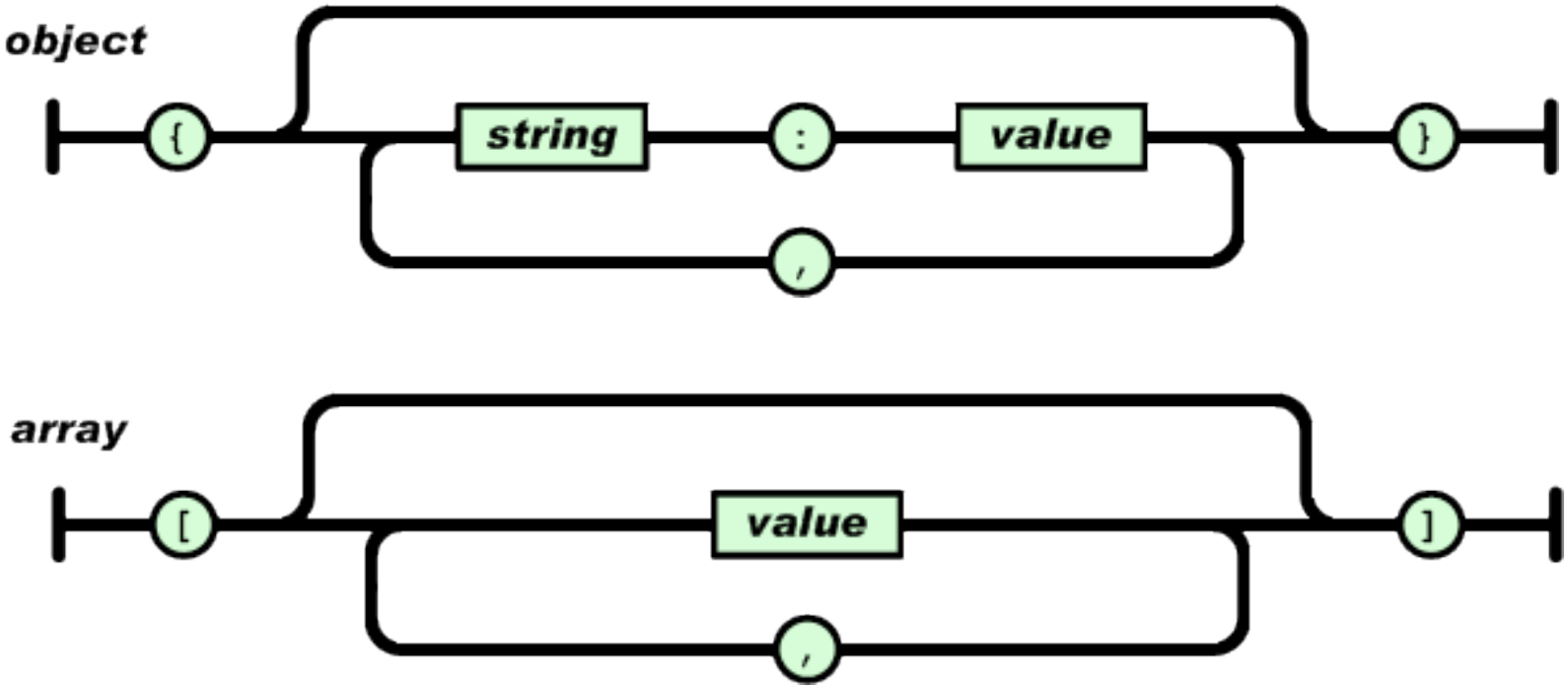
Parsing API

JSON Grammar



Source: http://json.org

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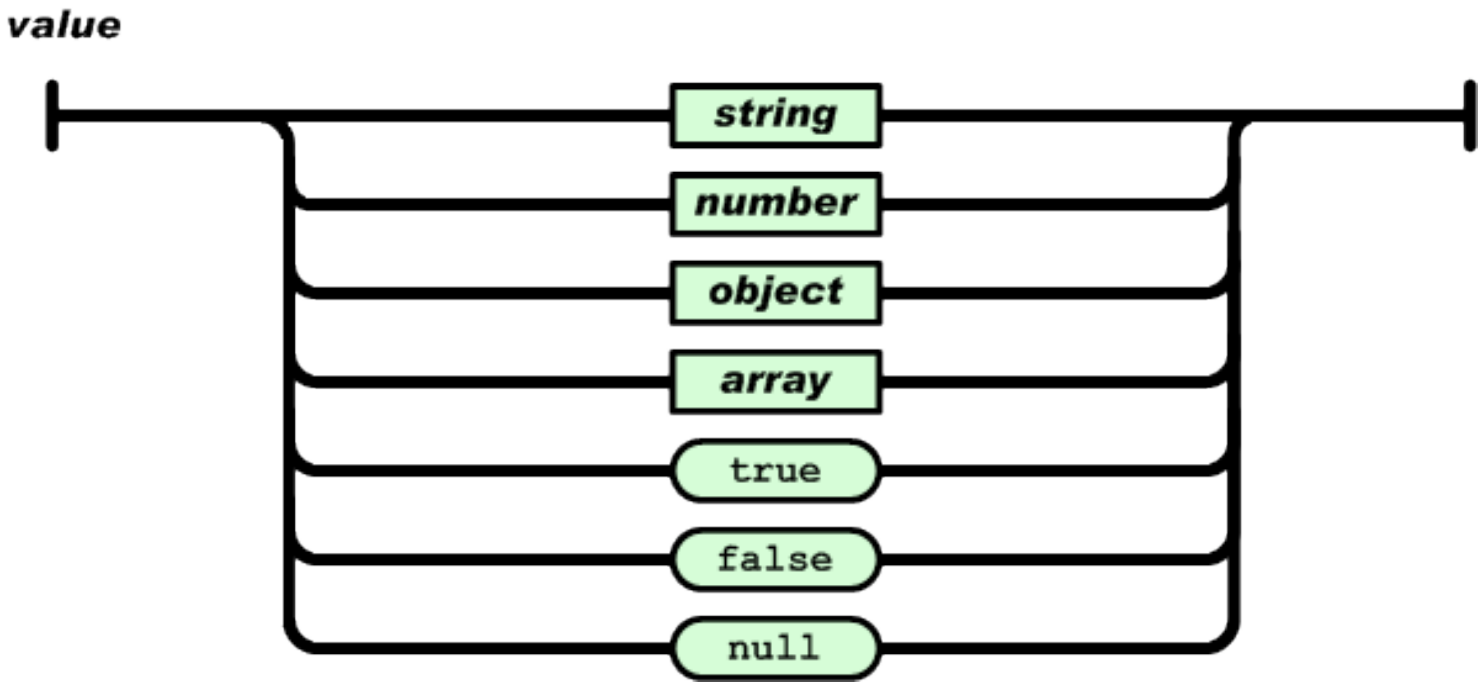
Parsing API

JSON Grammar



Source: http://json.org

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API

Resources

- http://weblogs.java.net/blog/jitu/archive/2011/03/15/json-jsrpre-jcp-filed-draft

Q&A

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