05
HTTP & Middle-ware

(MCA) CSA-507 Web Development
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HTTP

- Hyper Text Transfer Protocol
- Application-layer protocol
- Client-Server Model
- Stateless or Stateful ?
- Connectionless or connection-oriented ?
    - protocol stacking across layers

Understanding HTTP

- Versions (0.9 – 1.0 – 1.1 – 2 – 3)
- HTTP over TCP / HTTP over QUIC
- Flow
- Messages – Request / Response
- Headers
- CORS

HTTP Headers

- Request headers
- Response Headers
- Content-* Headers
- Payload Headers (for transport)
- Custom Headers (X-*)

- Read through the list of COMMON headers

HTTP Request Methods

- A method is ***safe***, *idempotent* and/or cacheable.
- *GET*, POST, ***HEAD***
- *PUT*, *DELETE*, PATCH
- CONNECT, ***OPTIONS***, TRACE

- Read through the list of request methods

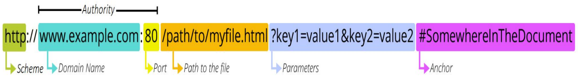
HTTP Response Status Codes

- Informational (1xx)
- Successful (2xx)
- Redirection (3xx)
- Client Error (4xx)
- Server Error (5xx)

- Read through the list of COMMON status codes

URL

- Uniform Resource Locator – address of resource (on the web)
- A browser convention
- Query Parameters – key-value pairs separated by “&”
- URL encoding and decoding


Authority
http://www.example.com:80/path/to/myfile.html?key1=value1&key2=value2#SomewhereInTheDocument
Scheme
Domain Name
Port
Path to the file
Parameters
Anchor

XML

- Data Storage & Transport Tool
- Parent Language to HTML
- Self-descriptive
- Markup ≠ Programming/Scripting
- Platform and Tool independent

XML Structure & Characteristics

- Tree-based with root-node
- Tags (Closed, Case-sensitive, correctly nested)
- Quoted attribute values
- “Well-formed” and/or “Valid”
    - (Specification vs DTD)
- XML Namespaces

XPath

- Navigating through elements, attributes, values

```
<students>
        <student rollno="101">
                <name>Rick Grimes</name>
                <age>35</age>
                <subject>Maths</subject>
                <gender>Male</gender>
        </student>
        <student rollno="102">
                <name>Daryl Dixon </name>
                <age>33</age>
                <subject>Science</subject>
                <gender>Male</gender>
        </student>
        <student rollno="103">
                <name>Maggie</name>
                <age>36</age>
                <subject>Arts</subject>
                <gender>Female</gender>
        </student>
        <classteacher>
                <name>Max</name>
        </classteacher>
</students>
```

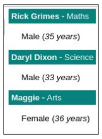
http://xpather.com/

XSLT (eXtensible Stylesheet Language Transformations)

- Rendering engine for XML

```
<?xml version="1.0" encoding="UTF-8"?>
<html xsl:version="1.0"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform">
<body style="font-family:Arial;font-size:12pt;background-color:#EEEEEE">
        <xsl:for-each select="students/student">
                <div
style="background-color:teal;color:white;padding:4px">
                        <span style="font-weight:bold"><xsl:value-of
select="name"/> - </span>
                        <xsl:value-of select="subject"/>
                </div>
                <div
style="margin-left:20px;margin-bottom:1em;font-size:10pt">
                        <p>
                                <xsl:value-of select="gender"/>
                                (<span style="font-style:italic">
<xsl:value-of select="age"/> years</span>)
                        </p>
                </div>
        </xsl:for-each>
</body>
</html>
```

https://xslttest.appspot.com/



Rick Grimes - Maths

Male (*35 years*)

Daryl Dixon - Science

Male (*33 years*)

Maggie - Arts

Female (*36 years*)

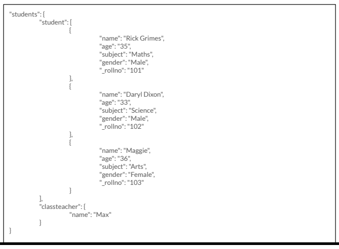
X–*, DTD/Schema

- XLink – hyperlink(ing) in a XML
- XQuery – query(ing) language for XML

- DTD – template for validating XML
- Schema – enhancement over DTD

JSON (JavaScript Object Notation)

- Data Storage and Transfer tool



```
"students": {
        "student": [
                {
                        "name": "Rick Grimes",
                        "age": "35",
                        "subject": "Maths",
                        "gender": "Male",
                        "_rollno": "101"
                },
                {
                        "name": "Daryl Dixon",
                        "age": "33",
                        "subject": "Science",
                        "gender": "Male",
                        "_rollno": "102"
                },
                {
                        "name": "Maggie",
                        "age": "36",
                        "subject": "Arts",
                        "gender": "Female",
                        "_rollno": "103"
                }
        ],
        "classteacher": {
                "name": "Max"
        }
}
```