

# IT2605

# Applications of Web Services

L06 Restful Web Service using JSON

# Objectives

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- ▶ What is REST?
- ▶ REST and HTTP verb
- ▶ REST request/response format
- ▶ JSON



# What is REST?

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- ▶ REST stands for **R**epresentational **S**tate **T**ransfer
- ▶ It is a protocol for exchanging data over a distributed environment.
- ▶ REST is *an architecture style* for designing networked applications
- ▶ REST is not a “standard”



# Why REST?

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- ▶ REST is what everybody has been doing since the founding of the web.
- ▶ REST web service care about the HTTP method used, the HTTP headers and their meanings, content type negotiation, HTTP authentication methods.
- ▶ SOAP sees HTTP only as a transport layer, whose job is only to deliver messages with its "SOAP envelope".



# What is REST?

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- ▶ REST uses HTTP for all four CRUD (Create/Read/Update/Delete) operations using simple HTTP verbs like (GET, POST, PUT, and DELETE)
  - GET – retrieve the required data from the remote resource
  - POST – update the current data on the remote server.
  - PUT – create a new entry for the current data that is being sent to the server.
  - DELETE – deleting specified data from remote resource.



# Sample HTTP URL for CRUD operation

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Operation	HTTP Method	Relative URI
Get all members	GET	www.mysite.com/members
Get a specific member	GET	www.mysite.com/members/{username}
Update a specific member	POST	www.mysite.com/members/{username}
Create a new member	PUT	www.mysite.com/members/{username}
Delete a specific member	DELETE	www.mysite.com/members/{username}



# REST SERVER RESPONSE FORMAT

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- ▶ A server response in REST can be
  - XML
  - CSV (comma-separated values)
  - JSON (JavaScript Object Notation)
- ▶ The popular REST server response for most API is **JSON**
- ▶ jQuery provides API to access remote REST service to retrieve and deserialize JSON data into javascript object.
- ▶ jQuery becomes popular language in mobile device programming that access data from remote server



# JSON

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- ▶ JSON is a text-based open standard designed for human-readable data interchange.
- ▶ JavaScript syntax
  - Data is represented in **name/value** pairs
  - **Curly braces** hold objects and each name is followed by **':'(colon)**, the name/value pairs are separated by **,** (**comma**).
  - **Square brackets** hold arrays and values are separated by **,**(comma).

## EXAMPLE

```
{ "employees": [  
  { "firstName": "John", "lastName": "Doe" },  
  { "firstName": "Anna", "lastName": "Smith" }  
 ] }
```





# Sample SCORE XML and JSON

## XML

```
<?xml version="1.0" encoding="utf-8" ?>
<score>
  <student admno="09111A">
    <yr>2009</yr>
    <sem>S2</sem>
    <test1>68</test1>
    <test2>54</test2>
    <test3>90</test3>
  </student>
  <student admno="09112B">
    <yr>2009</yr>
    <sem>S2</sem>
    <module>IT9999</module>
    <test1>97</test1>
    <test2>83.4</test2>
    <test3>90</test3>
  </student>
</score>
```

## JSON

```
{"score": [
  {"admno": "09111A", "yr": "2009", "sem": "S2", "test1": "68", "test2": "54", "test3": "90"},
  {"admno": "09112B", "yr": "2009", "sem": "S2", "test1": "97", "test2": "83", "test3": "90"}
]}
```

# Real REST example

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- ▶ The Google Glass API is a pure REST API.
- ▶ Twitter has a REST API used by Twitter Application Developer
- ▶ Flickr
- ▶ Amazon.com offer several REST services, e.g., for their S3 storage solution,
- ▶ Atom is a RESTful alternative to RSS,

