UNIVERSITÀ
DEGLI STUDI DI TRIESTE

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Corso di Laurea in Ingegneria Clinica e Biomedica
Informatica Medica I

WEB SERVICES, REST API, JSON

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WEB SERVICES

“A Web service is a **software system** designed to support **interoperable machine-to-machine interaction over a network.** It has an interface described in a machine-processable format (specifically WSDL). Other systems interact with the Web service in a manner prescribed by its description using SOAP-messages, typically conveyed using HTTP with an XML serialization in conjunction with other Web-related standards.”

W3C – World Wide Web Consortium

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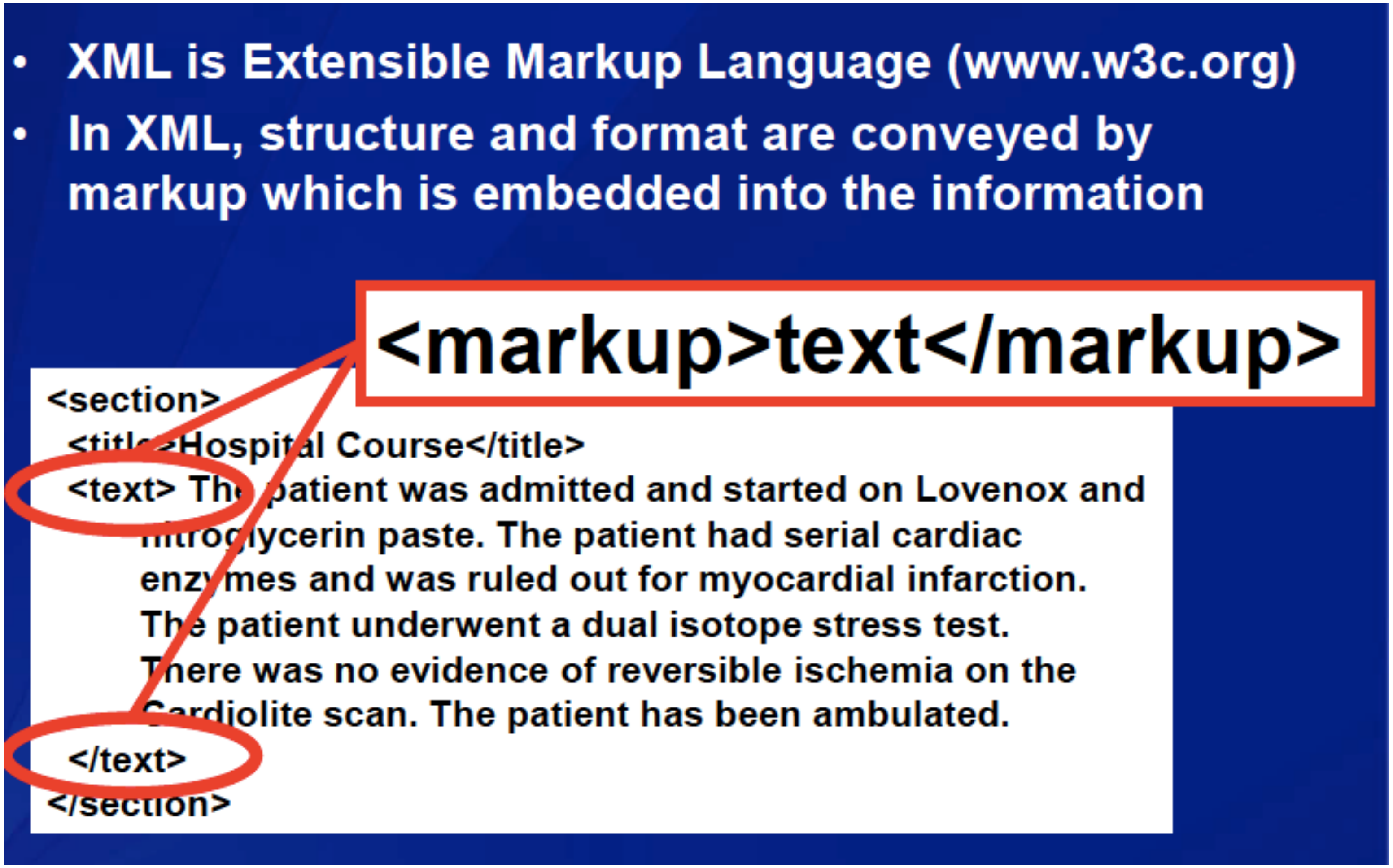
WSDL = Web Service Description Language

SOAP = Service Oriented Architecture Programming

XML = eXtensible Markup Language

I web services sono indipendenti dalla piattaforma su cui operano, quindi supportano l’interoperabilità

XML

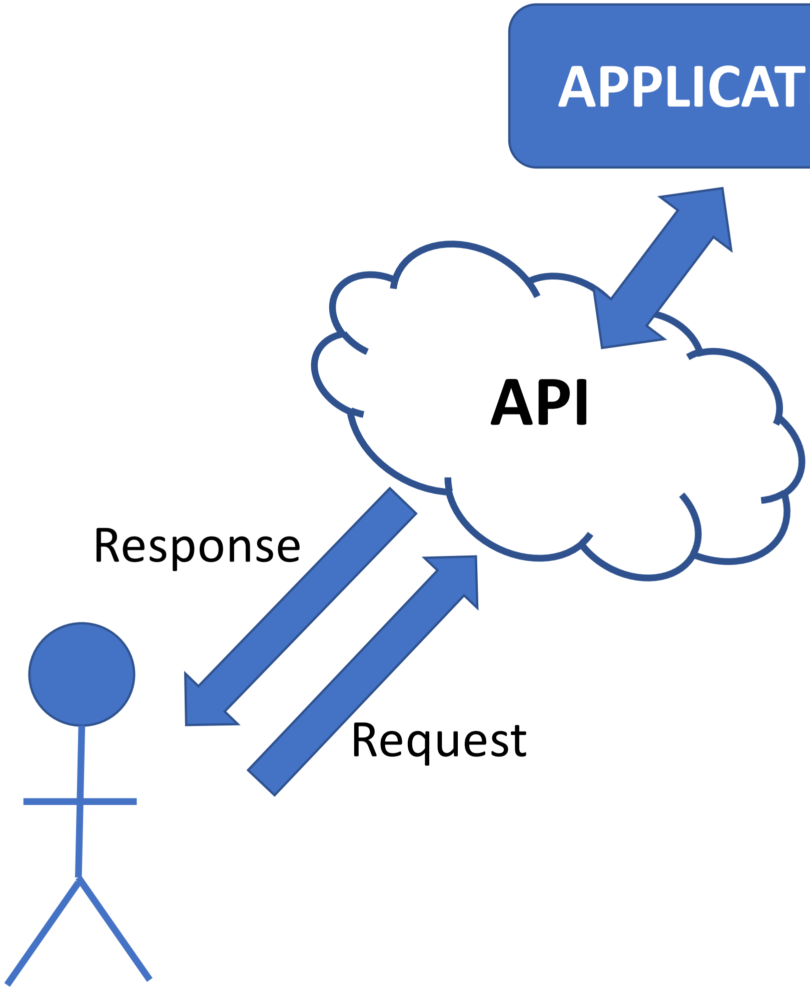


- XML is Extensible Markup Language (www.w3c.org)
- In XML, structure and format are conveyed by markup which is embedded into the information

```
<markup>text</markup>
```

```
<section>
 <title>Hospital Course</title>
 <text> The patient was admitted and started on Lovenox and
      nitroglycerin paste. The patient had serial cardiac
      enzymes and was ruled out for myocardial infarction.
      The patient underwent a dual isotope stress test.
      There was no evidence of reversible ischemia on the
      Cardiolite scan. The patient has been ambulated.
 </text>
</section>
```

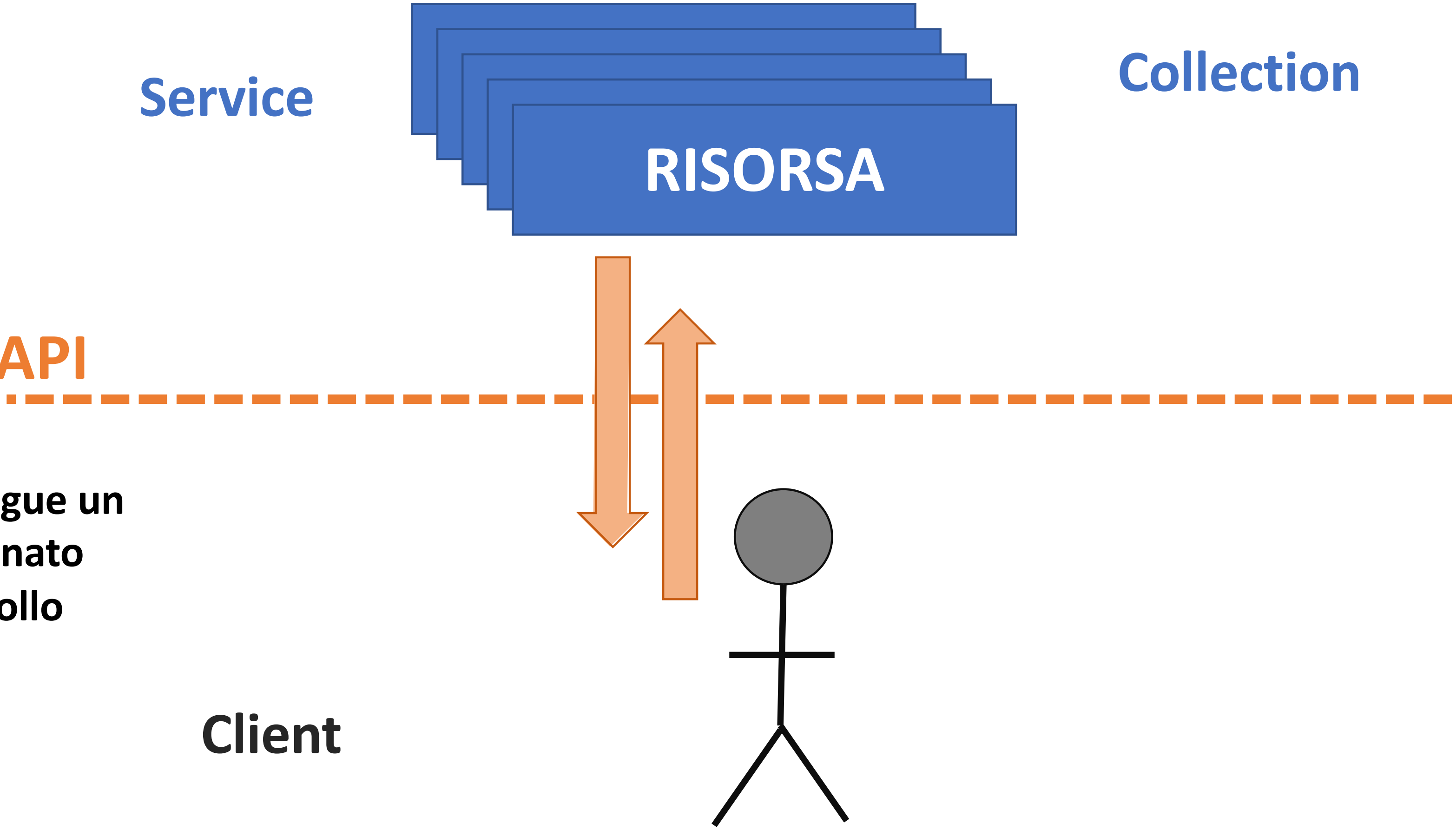
API - application programming interfaces



API =

- interface that can be used to program software that interacts with an existing application.
- a set of functions and procedures that allow you to access and build upon the data and functionality of an existing application.

REST API



Service

RISORSA

Collection

REST API

=

API che segue un determinato protocollo

Client

REST API

- REST = REpresentational State Transfer
- It is an architectural style used to build Web services that are lightweight, maintainable, and scalable in nature.
- A service which is built on the REST architecture is called a RESTful service.
- The underlying protocol for REST is usually HTTP, which is the basic web protocol. However, other protocols (SMTP etc) can be used.
- REST makes resources available through an URI

REST KEY COMPONENTS

Resources – Element that contains the information.

Request Verbs - Description of what you want to do with the resource.

- The basic request is GET (= retrieve data)
- POST (=create a new element)
- PUT (= update an existing element)
- DELETE (= delete an element)

Request Headers – Additional instructions sent with the request (type of response required, authorization details)

Request Body - Data is sent with the request (usually in a POST call)

Response Body – This is the main body of the response (XML document, JSON)

Response Status codes –General codes which are returned along with the response from the web server. (200 = OK, 404 = NOT FOUND)

RESOURCES

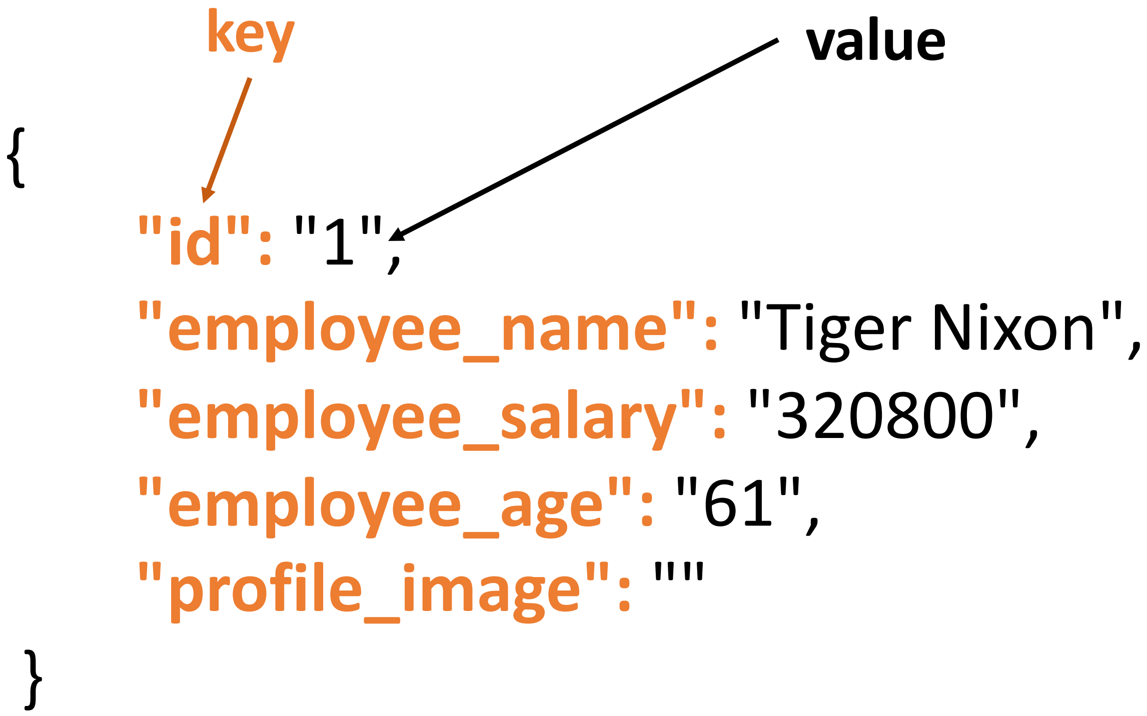
```
{
    "id": "1",
    "employee_name": "Tiger Nixon",
    "employee_salary": "320800",
    "employee_age": "61",
    "profile_image": ""
  }, {
    "id": "2",
    "employee_name": "Garrett Winters",
    "employee_salary": "170750",
    "employee_age": "63",
    "profile_image": ""
  }, {
    "id": "3",
    "employee_name": "Ashton Cox",
    "employee_salary": "86000",
    "employee_age": "66",
    "profile_image": ""
  },
```

```
{
    "id": "4",
    "employee_name": "Cedric Kelly",
    "employee_salary": "433060",
    "employee_age": "22",
    "profile_image": ""
  }, {
    "id": "5",
    "employee_name": "Airi Satou",
    "employee_salary": "162700",
    "employee_age": "33",
    "profile_image": ""
  }, …
```

http://dummy.restapiexample.com

JSON – JAVASCRIPT OBJECT NOTATION

Format to represent data exchanged in the Internet based on the concept of
key = value



key

value

```
{
    "id": "1",
    "employee_name": "Tiger Nixon",
    "employee_salary": "320800",
    "employee_age": "61",
    "profile_image": ""
}
```

REQUEST VERBS - GET

- The HTTP GET request method is used to get a resource from the server.
- The HTTP GET requests cannot have a message body but you still can send data to the server using the URL parameters.
- The GET requests should only receive data.
- The HTTP GET method is defined as idempotent, which means that multiple identical GET requests should have the same effect as a single request.

GET - EXAMPLE

- The request is simply an URL (you can copy and paste in your browser)
- You have to know the methods accepted by the service you are calling

http://dummy.restapiexample.com/api/v1/employees

REQUEST VERBS - POST

- The POST method allows to write a new resource
- The POST methods requires a body
- To post JSON to the server, you must set the appropriate content type for the request body.

Content-Type: application/json

- If your client is expecting a JSON string from the server, it should also send the Accept: application/json request header.

Accept: application/json

- The server informs the client that it has returned JSON using the Content-Type: application/json response header.

POST - EXAMPLE

- The request needs a body that has to be passed along with the request message

```
POST /api/v1/create HTTP/1.1
Host: dummy.restapiexample.com
Accept: application/json
Content-Type: application/json
Content-Length: 94
{
    "name": "test",
    "salary": "123",
    "age": "23",
    "id": 25
  }
```