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AN AUTONOMOUS INSTITUTION
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V SEMESTER

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

19TS501 - Cloud Computing
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UNIT – II

Topic: 2.2. RESTful Systems of Systems

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2.2 RESTful Systems of Systems

The most relevant alternative to SOAP/XML pair is Representational State Transfer (REST), which provides a model for designing network based software systems utilizing the client / server model and leverages the facilities provided by HTTP for IPC without additional burden.

In a RESTful system, a client sends a request over HTTP using the standard HTTP methods (PUT, GET, POST, and DELETE) and the server issues a response that includes the representation of the resource.

By relying on this minimal support, it is possible to provide whatever it needed to replace the basic and most important functionality provided by SOAP, which is method invocation.

The GET, PUT, POST, and DELETE methods constitute a minimal set of operations for retrieving, adding, modifying and deleting the data.

Together with an appropriate URI organization to identify resources, all the atomic operations required by a Web service are implemented.

The content of data is still transmitted using XML as part of the HTTP content, but the additional markup required by SOAP is removed.

For this reason, REST represents a lightweight alternative to SOAP, which works effectively in contexts where additional aspects beyond those manageable through HTTP are absent.

RESTful Web services operate in an environment where no additional security beyond the one supported by HTTP is required.

This is not a great limitation, and RESTful Web services are quite popular and used to deliver functionalities at enterprise scale:

Twitter

Yahoo! (search APIs, maps, photos, etc)

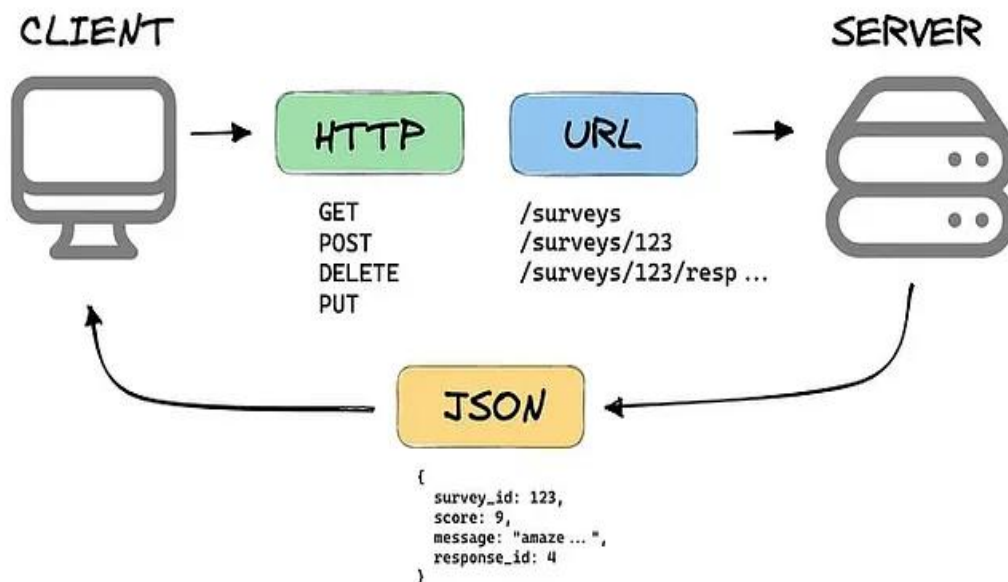
Flickr

Amazon.com

Web Service Description Language (WSDL) is an XML based language for the description of Web services.

It is used to define the interface of a Web service in terms of methods to be called and types and structures of the required parameters and return values.

WHAT IS A REST API?



In Figure 2.3 we notice that the SOAP messages for invoking the GetPrice method and receiving the result do not have any information about the type and structure of the parameters and the return values.

This information is stored within the WSDL document attached to the Web service.

Therefore, Web service consumer applications already know which types of parameters are required and how to interpret results.

As an XML based language, WSDL allows for the automatic generation of Web service clients that can be easily embedded into existing applications.

Moreover, XML is a platform and language independent specification, so clients for web services can be generated for any language that is capable of interpreting XML data.

This is a fundamental feature that enables Web service interoperability and one of the reasons that make such technology a solution of choice for SOA.

Besides those directly supporting Web services, other technologies that characterize Web 2.0 and contribute to enrich and empower Web applications and then SOA based systems.

These fall under the names of Asynchronous JavaScript and XML (AJAX), JavaScript Standard Object Notation (JSON) and others.

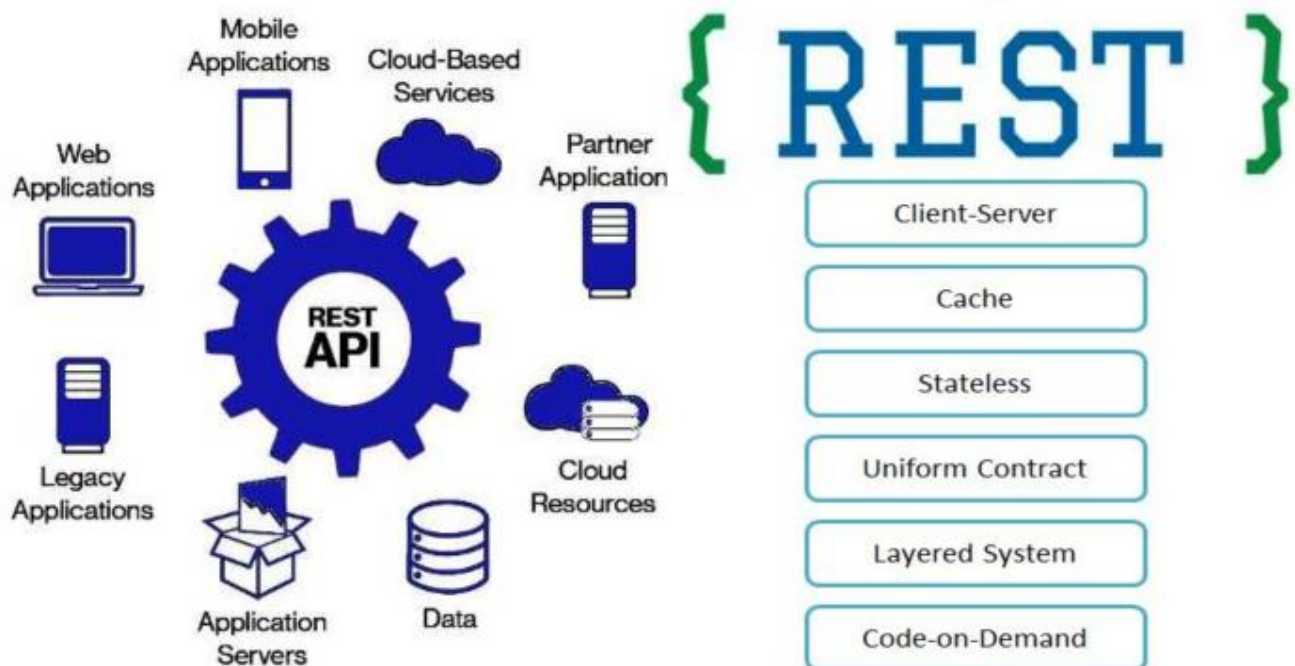
AJAX is a conceptual framework based on JavaScript and XML that enables asynchronous behavior in Web applications by leveraging the computing capabilities of modern Web browsers.

This transforms simple Web pages in complete applications and used to enrich the user experience.

AJAX uses XML to exchange data with Web services and applications

An alternative to XML is JSON, which allows representing objects and collections of objects in a platform independent manner.

Often it is preferred to transmit data in an AJAX context because compared to XML, it is a lighter notation and therefore allows transmitting the same amount of information in a more concise form.



There are various architectural models for developing API First systems. such as REST, SOAP, gRPC etc. One of the foremost models gaining a lot of ground currently is REST. REST stands for **Representational State Transfer**. Rest is a client server communication model which is stateless, resource based, and Idempotent. As an architectural model REST defines Resources, Identifiers, and state representations as basic blocks for building API's. REST is not a protocol, a file format, or a development framework, it is a set of design constraints. These design constraints collectively called the Fielding's constraints were first identified in Roy T. Fielding's 2000 dissertation on software architecture, which gathered them together under the name "REST". In the real-world REST uses HTTP as the protocol and Web servers as REST servers.