Optimization of Web Services and Semantic Web Performance using Different Techniques Provided by the Qos

Khadija Mahjoubi, Hassan Labriji

Abstract*: Current Web services research is increasingly using semantic models to extract useful information from the Web according to different principles of the Semantic Web which allowed to take advantage of the consideration of the meaning and the meaning of the exchanged data to improve the feasibility of the different tasks such as the description, the pairing, and the discovery. This work focuses on semantic-service-oriented architectures in which providers of different Web services can describe, publish, and discover Semantic Web Services, whose purpose is to solve problems such as information overload and the navigation problem, which concern the users of the Web.

In this paper, a solution to performance and optimization problems is proposed for the selection of web services at the QoS quality of service level taking into account the quality of service using different techniques provided by the QoS.

***Keywords*: Navigation, Optimization, finesse of web, Semantic, Web Services**

I. INTRODUCTION

Technological and computer innovation according to different uses in the field of the Web is mainly marked in the virtual space that are based on web services and thus offer development in research work for those interested in providing types web services and traceability [1].

Thanks to the increasing exploitation of data exchange technologies and tools such as XML Extensible Markup Language and different protocols such as HTTP, web services have enabled the Web to move from the usual role of information networks to a middleware application where the two domains of Web Services and Semantic Web intersect. Exploitation of Web Usage is a type of Web crawl that exploits information about access roads as well as the ways users visit websites, it allows to know the relevant results on the Web and is used to retrieve meaningful information from discovery patterns stored in servers. An important concern about the reliability of this use is to improve user support for building, modifying, querying, and querying.

According to the web search taxonomy defined by Border in [2] The intention of a web search can be of type navigation for example display of the URL of the site that we wish to reach, or transactional for display sites where we can perform a particular transaction (shop or download a file)[3].

This article discusses a solution for optimizing and performance of the quality of semantic Web services, in particular on a communication medium complying with the requirements of response time and bandwidth, based on the QoS quality of service, and on different contracts and QoS strategies.

II. GENERAL FRAMEWORK AND THEORETICAL CONTEXT

A. Web Services

Web services provide a common platform for multiple applications developed with different programming languages (Java, Net, Angular JS, Node.js ...) to communicate with each other.

It is a standardized service that allows communication between client and server applications on the WWW (World Wide Web), through requests sent to the server that hosts the service and that are done through remote procedure calls. (Remote Procedure Calls).

These different data are in XML (Extensible Markup Language). XML is the counterpart of HTML which is an intermediate language understood by most programming languages.

To send XML data between applications, web services use different protocols that govern data exchange. The data sent from the web service to the application is called SOAP messages. It's just a document in XML format [4].

The following figure defines the relationship between Web Services clients and SOAP:

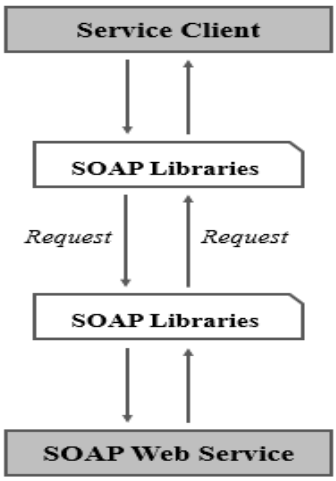

Fig. 1.Relationship between Web services and SOAP

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B. Issues and limitations

The main problems that affect web users are information overload and the complexity of navigation level queries. However, there is a flow of distributed resources on the Web that makes the network difficult to use at the same time and to apply in depth.

The consequences of the lack of support for different main actions that users perform during classic Web search:

- The construction and refinement of requests;
- The selection of results;
- The exploration and use of results.

To access, retrieve and interpret information to web services the majority of data on the Web is in a form that does not allow for large-scale use and there is no comprehensive data publishing system to machines and humans to process them and that different information is presented by many websites, but almost all in HTML format (logical structure + presentation).

It would then require a common representation that uses a standard language to be able to cross the data in an automatic way using a standard and controlled vocabulary and an ontology allowing:

- Comparison of documents;
- Reasoning to process and solve a request;
- Taking into account multimedia documents;
- Answers formed from several documents.

The computer simulation of such a web service creates favorable conditions for investment and user engagement. This contribution aims to study on a computer running the Web according to a client / server architecture [5].

The solution provided by the Semantic Web is to separate the presentation from the content and that each resource (document or object) is identified by a URI by using an RDF common language to express information about resources.

C. Semantic Web

The Semantic Web is an extension of the classic Web, facilitating the automation of the processing of available knowledge, and is supported by the W3C. Les informations dans le Web sémantique ne sont pas représentées dans une langue naturelle mais formalisées à l'aide de langages communs pouvant être interprétés par des machines.

The Semantic Web will then be a vast space of exchanges of informative resources between machines allowing the exploitation of a large volume of information and varied services. According to Tim Berners Lee's definition, the Semantic Web is an increase in the currently used Web for which information has a well-defined meaning that allows users (computers and/or people) to work better together.

The Semantic Web requires a shared architecture to exchange resources on the Internet, and standards for associated ontologies and inference mechanisms, formats and addressing of resources or documents.

The W3C common layered architecture is a view classified into five major families:

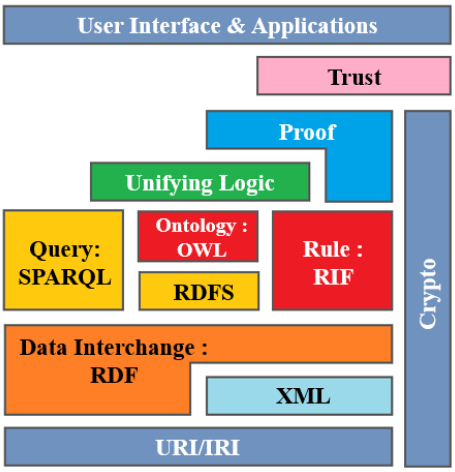

Fig. 2.semantic web architecture

D. Quality of service (QoS)

QoS is a set of technologies that allow applications to request and receive predictable service levels in terms of data throughput (bandwidth) and delay [6].

It refers to the ability of a network to provide better service to selected network traffic on various underlying technologies, using the following methods:

- Definition of network traffic priorities and formatting management;
- Improvement of loss characteristics;
- Supports dedicated bandwidth;
- Prevention and management of network congestion.

These methods correspond to the manipulation of the traffic so that a network equipment, such as a router or a switch, can transfer this traffic in accordance with the required behaviors on behalf of the applications at the origin of this traffic.

Unlike circuit-switched networks, in which the communication circuit is dedicated to the time base. This table shows the difference between the classic Web and the semantic Web:

Table- I: Design phase of the simulation application Characteristics of the classic Web and the Semantic Web

The current web	The Semantic Web
Documents	Knowledge
Based on HTML	Based on XML and RDF
Keyword searches	Research by concepts
Usable by humans	Machine-usable

III. METHODOLOGY AND DEVELOPMENT

A. Diagram of use of QoS contracts

The diagram proposed in this study consists in representing in a structured way the constructions of contracts between customers and suppliers for a perfect use of QoS.Contracts are agreements between the provider and the customer of a QoS service.Contracts can specify the obligations of the supplier and the customer. For example, a contract can say that provided the

client makes requests per second (requests), the provider ensures that these requests are processed in less than a few tens of milliseconds; the customer must respect the clause and the second is an obligation of the supplier.

Contracts are usually negotiated off-line, before the service is called by the customer. Any QoS management method involving contracts is accompanied by different techniques, to ensure that the obligations in the contract are met.

Three levels of QoS services are generally defined according to the following schema:

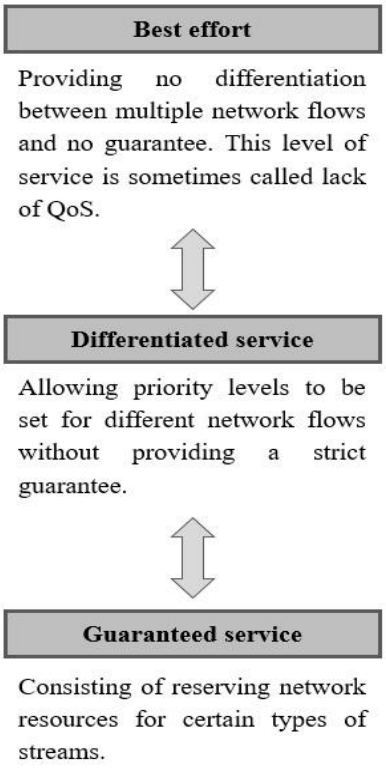

Fig. 3.QoS service levels

B. proposed algorithm

Our algorithm consists in applying a set of instructions defined in a precise way the criteria of evaluation of the quality of such a service, in order to lead us to the results.

- Throughput (bandwidth): maximum amount of information (bits) / unit of time;
- Jitter: fluctuation of the digital signal, in time or in phase;
- Delay or response time: delay between sending and receiving a packet;
- Loss of package: non-delivery of a data packet, mostly due to network congestion; Sequencing: this is a modification of the order of arrival of the packets.

C. Flow Chart and functioning of the QoS strategy

Our flow diagram schematically represents different relationship links for such a process to occur when you start the user or computer configuration:

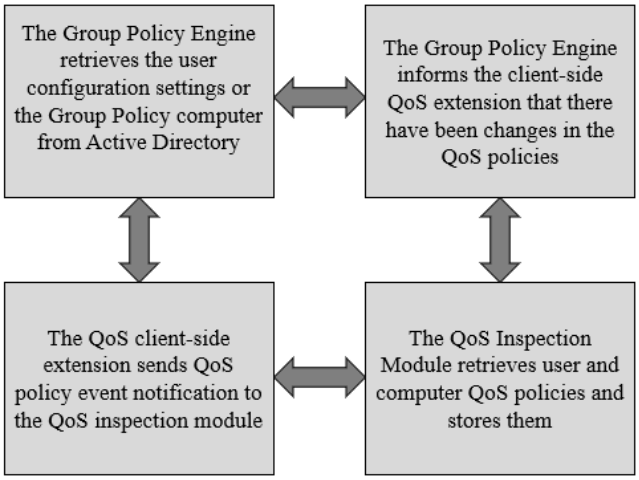

Fig. 4.Flow chart of the QoS

IV. TEST AND RESULT

For this test phase, an example configuration is provided.

It shows how to configure QoS for a Cisco Unified Wireless network using Cisco Wireless LAN Controllers (WLCs) and Lightweight Access Points (LAPs) [7].

All information used is based on hardware and software versions as shown in the following table:

Table- II: Hardware and software versions for testing

Cisco 2006 WLC	runs firmware version 4.0
Cisco 2006 WLC LAP	of the Cisco 1000 Series
Cisco 802.11a / b / g Wireless Client Adapter	running firmware version 2.6
Cisco 3725 Router	runs Cisco IOS® Software Release 12.3 (4) T1
Cisco 3640 Router	runs Cisco IOS Software Release 12.2 (26)
Two Cisco 3500 XL Series Switches	run the Cisco IOS Software Release 12.0 (5) WC3b.

QoS means the capacity of the network to provide for a set of users or applications to the detriment of other uses. With this quality, bandwidth can be managed more efficiently over local networks (WLAN and WAN). This is how QoS provides enhanced and trusted network service [7]:

- Dedicated bandwidth of media for essential users and applications;
- Jitter and latency controls (required by real-time traffic);
- Manages and reduces network congestion;
- Form network traffic to smooth traffic;
- Set network traffic priorities.

The exploitation of our software solution consists in applying this technology based on QoS on a set of administrators and personnel who work within the Ben M'sik faculty of sciences in order to deduce the efficiency of the proposed algorithm.

The survey was on 30 people, and that 88% among them mentioned that this tool is more beneficial for studying traceability, resource management of the establishment's databases. 74% used this tool to capture different documents from the outside.

V. CONCLUSION

We expose in this paper the exploitation of web services and semantic web knowledge, as well as the quality of QoS services for different uses.

We have identified a problem that affects web users (overloads, navigation complexity, ...), and we have proposed a technical solution to improve performance in the ontology inference process through appropriate QoS approaches. 88% of 30 administrators indicated that this tool is more beneficial in terms of robustness

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