IOSR Journal of Computer Engineering (IOSR-JCE)
e-ISSN: 2278-0661,p-ISSN: 2278-8727, Volume 17, Issue 2, Ver. V (Mar – Apr. 2015), PP 119-124
www.iosrjournals.org

A XMLRPC Approach to the Management of Cloud Infrastructure

Moninderpal kaur[1], Rajnish Kansal[2]
[1](M.Tech ScholarCSE, Asra College of Engineering & Technology Punjab, India)
[2](Astt. Prof. CSE, Asra College of Engineering & Technology Punjab, India)

***Abstract*:** *Main problems of mobile computing are connections setbacks, bandwidth, heterogeneous webs and bottleneck issues. With the advent of the Internet and the plurality and collection of elaborate requests it held alongside it, the demand for extra elevated services on cellular phones is increasingly becoming urgent. Unfortunately, the new enabling technologies did not prosper in boosting new services. The adoption of Internet services has shown to be extra tough due to the difference amid the Internet and the mobile telecommunication system. Many examined the characteristics of the mobile arrangement and to elucidate the constraints that are imposed on continuing mobile services. This paper investigates the Web services for supporting for existing online and cloud based services for Smartphone's using middleware architectures.*

Key Words: *API, RESTful, SOA, symmetric and asymmetric cryptography, Mediation framework, Mediation Architecture, Web Services, Heterogeneity*

I. Web Services

Web Services is a knowledge related to the believed of Service Oriented Calculating (SOA) [1]. A Web Service is "A multimedia arrangement projected to prop interoperable machine-to-machine contact above a web [2]. It has an interface delineated in a machine process sable format (e.g. WSDL). Supplementary arrangements interact alongside the WS in a manner counseled by its description employing memos, normally communicated employing HTTP alongside an XML serialization in conjunction alongside supplementary Web-elated standards."[3] There are two WS protocols standards, SOAP WS and RESTful WS [4][5]. Figure 1 below displays SOAP WS in a service-oriented architecture. SOAP WS have well-adopted standards.
Following are the steps of consuming SOAP WS:

a) Service providers publish services to the ability registry pursuing the UDDI standard.
b) Clients additionally pursue UDDI to notice the ability they need.
c) Clients produce program for a specific SOAP WS from the WSDL.
d) Clients transactions SOAP memos alongside the ability employing the HTTP protocol.

An alternative to SOAP WS are RESTful WS [5]. RESTful WS were early given by Fielding [2] in his doctoral dissertation in 2002. They pursue a resource-oriented computing paradigm. RESTful WS are given as resources that are recognized by a Uniform Resource Identifier (URI). Clients converse alongside RESTful WS across the HTTP protocol, but the memo body can pursue each format, for example XML and JSON, as long as the clients and the ability providers concur on it. RESTful WS additionally seize supremacy of the semantics of the HTTP protocol [6]. For example, HTTP GET appeal is for buying a resource and HTTP POST appeal is for crafting a resource. URL query, HTTP header, and appeal body can all be utilized as ability inputs.

Problem Definition

Consuming WS from a smartphone is different compared to the standard WS scenarios due to the following factors:

- Mobile devices have limited resources in terms of CPU power and screen size.
- The communication in smartphone is established through wireless network.
- Existing services in the cloud are not supported in Smartphone.

There are several problemswhile accessing Web Services through smartphones Figure 3.1 above shows how a smartphone consuming a web service on a cloud. The following are the main focus of this work.

a) Loss of connection Problem: Since the smartphone based devices are not stable and due to the mobility of the smartphones and the wireless network setup, smartphones can be temporarily removed from the previous connected network and later may join network.

b) Bandwidth/Latency Problem: Cell networks have a very limited bandwidth and are often billed based on the amount of data transferred. However, even a simple SOAP message often contains a large chunk of XML data, which consumes a lot of bandwidth and the transmission can cause major network latency. In addition, the SOAP message contains mostly XML tags that are not all necessary for mobile clients.

c) Limited resources problem: Smartphone clients are normally "thin clients" with a less processing power. They also have limited screen size and computational power. These shortcomings are only due to mobility.

d) Security Problem: Since these devices actually usethe wireless networks which is very much vulnerable and data can easy be hacked and devices compromised.

Objectives

The goal of the middleware architecture is to find an efficient and scalable architecture for connecting the smartphones to the existing internet web services. The objectives of this research are as follows:

1) To enhance the interaction between mobile clients and Web Services through protocol transformation i.e. from SOAP to Restful conversion.
2) To make the result more optimized through JSON to XML conversion.
3) To enhance the security of the communication between the smartphones and middleware with the use of various cryptographic algorithms.
4) To use the Cloud platform and middleware as a way to improve scalability and reliability of the middleware.

Web Services As Mediation Frameworks

Web services are going mobile. Web Services and mobile data services are the newest trends in data arrangements engineering in wired and wireless areas, respectively. Web Services have a colossal scope of ability allocations as mobile phones have colossal and increasing user base. To address the confluence of Web Services and pervasive mobile mechanisms and contact settings, a frank mobile Web Service provider was industrialized for Smartphone's. The presentation of this Mobile Host was additionally analyzed in detail. A Mobile Enterprise can be instituted in a cellular web by providing Mobile Hosts that deed as web skill providers, and their clients. Mobile Hosts enable seamless integration of user- specific services to the enterprise, by pursuing web skill standards, additionally on the wireless link and via resource constrained intelligent phones.

Mobile Web Services Arbitration Framework

A simple Smartphone's retrieving web services through Web Services is shown in Fig. 1. The arbitration framework is instituted as an intermediary amid the WS clients and the Mobile Hosts in JXTA network. The adjacent P2P web is instituted in the mobile operator web alongside one of the node in operator proprietary web, substituting as a JXTA super peer. The super peer can tolerate at Center Transceiver Station (BTS) and can be related to supplementary center stations spreading the JXTA web into the mobile operator network. The mobile terminals use JXME, a light edition of JXTA for mobile devices. The WS clients can admission the used services across MWSMF and JXTA network. External WS clients can additionally undeviatingly admission the Web Services utilized on the Mobile Hosts, as long as the Mobile Hosts are endowed alongside span IPs and the Web Services are published alongside the UDDI registry at the arbitration framework. Consequently the MWSMF additionally deeds as external gateway from Internet to the mobile P2P network.

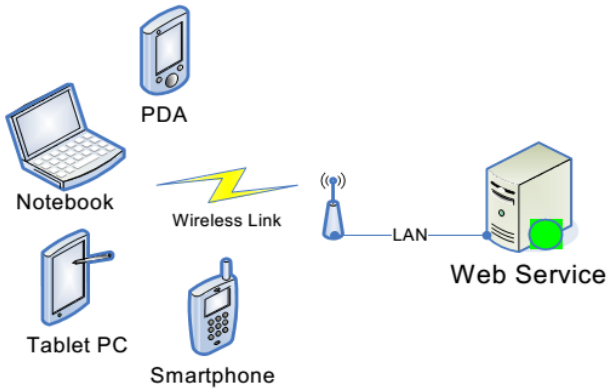

Figure 1: Smartphone's accessing web services through Web Services

Need of Arbitration Frameworks

The key examinations in constructing data services are to lower the intricacy of multimedia design and to minimize the multimedia maintenance cost. Mediators are given to cope alongside these subjects in vibrant obliging computing environments. Mediators are intelligent middleware that sit amid data arrangement origins and clients. They furnish consolidated data, lacking the demand to incorporate the actual data sources. Specifically, mediators present intentions such as accessing and incorporating domain-specific data from

heterogeneous origins, rearranging the aftermath into object-oriented constructions, and removing appropriate data to be transmitted.

Advantages and disadvantages

In advantages and disadvantages two frank subjects are addressed: universal accessibility from mechanisms to data services, and collaboration amid the parties accessing the data services. The main subject calls for the progress of mechanism self-governing data services that have the flexibility to prop expansive scope of client devices. We familiarize a mediation-based framework that enables the data clients to calibrate the basis data services to the clients' characteristics. The consecutive subject needs competent integration of data services, for that we address in two ways:

1. we draft an ontology average and delineate how such average can be effectually demanded for exchanging arranging information;
2. we illuminate a groundwork that is chiefly suitable for the integration of engineering services. A prototype for the omnipresent computing nature has been industrialized that incorporates a collection of consenting association multimedia as well as disparate mechanisms fluctuating from PDA, web browsers, desktop computers, and servers.

Two main characteristics of omnipresent computing are:

(1) Universal accessibility from each mechanism to each data ability
(2) Competent collaboration amid the parties accessing data services.

Protocols utilized in Arbitration Frameworks

SOAP: Service Oriented Design is the latest trend in data arrangements engineering. It is a constituent ideal, providing a method for constructing distributed systems. SOA brings appeal functionality as services to end-user demands and supplementary services, carrying the benefits of loose coupling and encapsulation to the enterprise appeal integration. SOA is not a new trusted and countless technologies like CORBA and DCOM are at least partly embody this idea. Web Services are newest of these events and by distant the best method of accomplished SOA.

Xml: Objects can be embodied in countless data formats. Even nevertheless XML is not harshly object-oriented; we select XML as our data representation format instituted on XML's nature of extensibility, assembly, and validation as a speech. As an facile textual speech, XML is quickly obtaining popularity for data representation and deals on the Web. XML is a meta-markup speech that consists of a set of regulations for crafting semantic tags utilized to delineate data. An XML agent is made up of an onset tag, a finish tag, and content in between. The onset and finish tags delineate the content inside the tags, that is trusted the worth of the element. In supplement to tags and benefits, qualities are endowed to annotate elements. Thus, XML files encompass both data and structural information. In core, XML provides the mechanism to delineate a pecking order of agents that forms the object.

II. Mobile upholding Arbitration Frameworks

Web services design methods melodramatically adjusted above the sequence of the past two decades. Web services enable multimedia as a skill to grasp multimedia services above the web retaining technologies such as XML. Web services that comply alongside SOA design and use the SOAP protocol to converse amid the client interface and provider are shouted SOAP-based Web services. In 2000, Fielding counseled a new design style for network-based demands shouted"Representational State Transfer (REST)". REST aimed at the generalization of interfaces, scalability of link, and self-governing placements of multimedia components. Web services crafted on top of REST principles are yelled RESTful Web services. The consecutive two subsections shed light on these two architectural ways alongside a comprehensive analogy amid them.

1) SOAP-based

SOAP-based Web services are projected to permit RPC-like link alongside remote systems. In this design style the skill provider and probable customers demand to institute area understanding of the ability syntax and the procedures it offers Fig 2. Every single solitary SOAP-based Web ability has its own exceptional interface and is delineated by way of the Web Services Description Speech (WSDL), and that description is published in a span Universal Description Conception and Integration (UUDI) registry. The UDDI manages and maintains these Web services' entries and keeps a reference for the Web skill description file (WSDL document). XML is utilized to craft the frank blocks of Web skill link by method of a slight form of XML messaging protocol, such as SOAP (Simple Object Admission Protocol) or XML-RPC (XML-Remote Procedure Call).

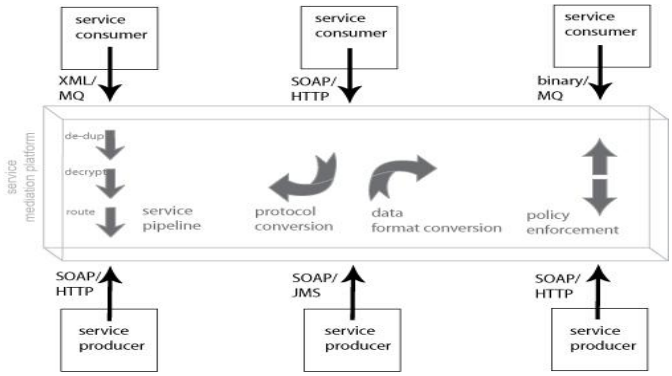

Figure 2: SOAP and XML based mediation

2) REST-based

In difference to the SOAP-based way, REpresentational State Transfer (REST), additionally shouted Resource Oriented Design (ROA), is a style of multimedia design that relies on the fact that each resource (such as Web services) can be recognized by their URLs. In his dissertation, Fielding defines the REST way as follows:"Representational State Transfer is aimed to evoke an picture of how a well-designed Web request behaves: a web of web pages (a adjacent state-machine), whereas the user progresses across an request by selecting links (state transitions), emerging in the subsequent page (representing the subsequent state of the application) being transferred to the user and rendered for their use".

Mediation Frameworks in Cloud Environments

Nagarajan et al. categorize the disparate semantic interoperability concerns that apply to Web services. They discriminate countless aspects that are particularly useful for the aim of semantic mediation. OWL-S is a speech for semantic description of Web services, relying on the OWL speech, OWL-S enables explicit semantic description of Web services input and output parameters via references to thoughts delineated in OWL area ontologies. With Miller et al. counsel an annotation to the average description language, WSDL in order to enable the semantic description of Web services. Though, OWL-S is a maximum speech and does not proposition the benefits of WSDL annotation, and the WSDL-S annotation normally relies on span ontologies and does not prop supplementary context qualities nor the use of context ontologies. With WSMX, Haller et al. counsel a resolution that is a serving of the WSMO framework (WSMX is the reference implementation of WSMO). In this work, the semantics of the words utilized are encoded into the WSMO description files of the services. Semantic heterogeneities amid Web services are resolved by reasoning on the content of an area span ontology that has for aim to explicitly delineate reference vocabulary. The arbitration procedure is not considering changing data but supplementary considering matching the semantic description stored in the ontologies. Dogac et al. counsel an interoperability framework for the healthcare domain. This framework relies on the trusted of archetype to delineate data semantics. An archetype is a proper method to delineate span thoughts via constraints on data. Data instances are constrained instances of a reference span model. This work is comparable to our context-based method in the sense that a area accord is made on a span trusted, and the disparate sights of Web services are embodied below the form of constraints above the instances of these span concepts. Though, the work of Dogac et al. needs the span trusted to encompass all the disparate Mrissa et al. sights ofWeb services, that is feasible in the healthcare span whereas predefined models are concurred on, but not in a supplementary finished context as provided in this chapter. In [6], Bowers and Ludscher counsel a semantic arbitration framework for logical workflows. Their work relies on the trusted of semantic kind and structural kind, described on a globe ontology area by all the users. The semantic kind corresponds to the hypothetical trusted that characterizes data, and the structural kind is the schema that describes data structure. For a solitary semantic kind, the aim is to change the disparate structural data representations of Web services. This paper relies on normal semantic matching methods beforehand providing structural-level data mediation. In the present work, we counsel context-based, semantic-level data arbitration for Web services.

Consuming Web Service Web Services through the Middleware

This examination assesses the overhead associated alongside disparate WS interactions. Web Service News Portal provides both SOAP and RESTful WS interfaces for their News service. Their RESTful WS revisit consequence in whichever XML or JSON format. The tested web ability is "id", that returns an article below that id. The maximum catalog size is 100 and the keyword utilized is "Android". The middleware is run on the average server. The Web Service segment of JSON and XML consequence were seized for the examinations for the Web Services. The size of the J S O N consequence is concerning 121 KB and the size of the X M L

consequence is concerning 170 KB. The JSON is more modified into the Compressed JSON employing the JavaScript Cryptography Libraries. The Size of the COMPRESSED JSON chunk is decreased to 115Kb. The burden dynamo sends HTTP appeal at the rate of 1 appeal each 10 subsequent (exponential allocation, mean 0.1request/s), so the middleware does not overload.

III. Results

The aftermath of the experimentation are debated in this serving and they are able to clarify that the smartphones can consume COMPRESSED JSON across middleware and they can be used on the smartphone client and run of an embedded browser. The protection is additionally enhanced alongside the use of JavaScript established Crypto algorithms.

Table 1: Protocols used in various case scenarios

Case Scenario	Protocol Used	Minimum (ms)	Avg (ms)	Maximum (ms)
I	JSON direct	0.051	0.093	0.177
II	JSON Middleware with JSON.	0.048	0.109	0.238
III	Middleware optimized.	0.056	0.11	0.277
IV	XML direct	0.055	0.111	0.317
V	XML middleware	0.058	0.128	0.388
VI	XML middleware optimized	0.06	0.187	0.469

TABLE displays a graph contrasting the reply periods of disparate interactions. The case scenarios that are seized generally deals alongside whichever XML established protocols or the COMPRESSED JSON established protocols alongside optimized and non-optimized results. There is overhead associated alongside the middleware. Though, consequence optimization considerably reduces the bandwidth alongside case scenarios employing the optimization.

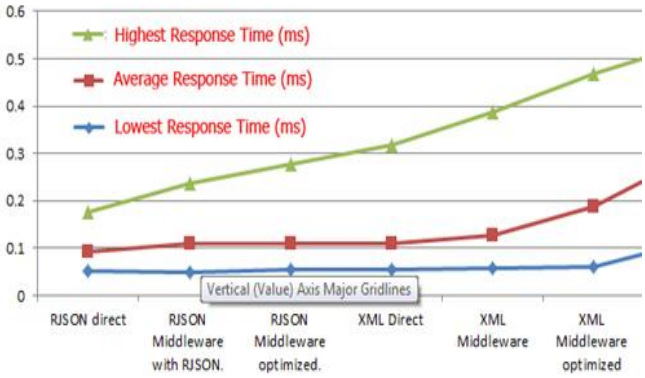

Figure: 3 Graph of Response Time Comparison

From Fig.3 the following conclusions are drawn for the minimum, average and maximum response time:

a) Smartphones have undeviatingly accessed the middleware in Case Scenarios I, II IV and V, whether the Web Service services id revisit COMPRESSED JSON or XML. The overhead is generally provoked by web latency amid the client and middleware. As there is no optimization completed the stay is all due to the web latency.

b) When aftermath are contrasted for the Case Scenarios of COMPRESSED JSON (I, II and III) alongside Case Scenarios of XML (IV, V and VI). The contact utilized by JSON has less reply period than XML. It is because the XML memos are extremely colossal that reasons transmission stay of packets consequently decelerating down the system.

c) The analogy of the optimized and non-optimized protocols in the Case Scenarios II and III of JSON alongside the Case Scenarios V and VI for XML delineates that optimization alongside JSON reduces the reply period a little. It precisely adds a slight overhead on the reply time. Because the middleware does not do each processing of the ability aftermath, contrasting the experimental aftermath JSON optimization alongside XML adds a slight overhead.

6.1.2 Evaluation of scalability using multiple concurrent Requests for JSON and SOAP

The Web Service request was additionally tested for several simultaneous demands and as shown in Fig.4 below for SOAP whereas several demands from a Smartphone were thrown at the middleware.

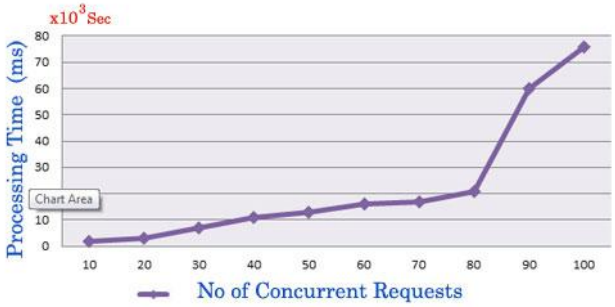

Figure 4: Effect of Concurrent requests on Process time for SOAP

Major parameters that were seized in thought were recollection consumption ratio, Reply period ratio, Memo Length ratio. Both JSON and SOAP established protocols were tested and JSON inclines to deviate less than the SOAP. This evaluation is grasped out by assessing concurrency whereas a number of clients dispatch demands to the alike host simultaneously. Concurrency is accomplished across commencing threads and loops on the client. Figure 4above displays the result of several demands thrown from a Smartphone at the middleware.

IV. Conclusions and Future Scope

Consuming Web Service from a Smartphone is unlike the average Web Service scenarios due the fact that Mobile mechanisms have manipulated resources in words of CPU manipulation and screen size. All the connections in Smartphone's are instituted across wireless web additionally continuing services in the cloud are not required in Smartphones. Smartphones have exceptional properties like they are tiny and portable. They are confidential mechanisms alongside assorted sensors. Though, these intelligent phones have limitations, for example, tiny bandwidth, defeat connectivity and less procedure power. On the other hand, the continuing services are normally projected for stationary clients. For example, SOAP is a protocol that involves a lot of XML parsing. To vanquish the limitations, a Middleware for the mobile established design is being counseled for relating mobile mechanism to the continuing Cloud Services.

In Future instead of RESTful protocol, SOAP protocol can additionally be utilized for optimized contact among the smartphone and middleware deploying the data construction established SOAP construction for competent communication. Caching can be utilized to cope alongside manipulated bandwidth and capitulated connectivity.

Acknowledgement

The authors are very thankful to the management of ACET, Punjab for their guidance and support. We are also thankful to CSE department of ACET, Punjab for their invaluable detailed advices on grammar, organization, and the theme of the paper. Last but not the least we are greatly indebted to our family and friends who always encouraged us to attain our goal.

References

[1]. Papazoglou, M.P., Traverso, P. and Leymann, F., 2003. "Service-oriented computing", International Journal of Cooperative Information Systems (IJCIS), Vol. 17, No. 2, pp. 25-28.

[2]. Fielding, R., 2010. "Architectural styles and the design of network-based software architectures", Ph.D. Dissertation, University of California, Irvine.

[3]. Asif, M. and Majumdar, S., 2008. "Performance analysis of Mobile Web Service Partitioning Frameworks", Proceedings of 16th IEEE International Conference on Advanced computing and Communications (ADCOM 2008), Carleton University, Ottawa, December 2008, pp. 190-197.

[4]. AlShahwan, F., 2010. "Evaluation of Distributed SOAP and RESTful Mobile Web Services", International Journal on Advances in Networks and Services, Vol. 3, No. 3, pp. 447-461.

[5]. Moessner, K. and AlShahwan, F., 2010. "Providing SOAP Web Services and RESTful Web Services from Mobile Hosts," Proceedings of Fifth International Conference on Internet and Web Applications and Services (ICIW 2010), University of Surrey, Guildford, UK, May 2010, pp. 174-179.

[6]. Pautasso, C., Zimmermann, O. and Leymann, F., 2008. "Restful web services vs. "big"' web services: making the right architectural decision", Proceeding of the 17th international Conference on World Wide Web, ACM New York, NY, USA, Feb 2008, pp.805-814.