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TOPIC

Analyzing an XML document using mobile agents

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TABLE OF CONTENTS

<u>GENERAL INTRODUCTION</u>	<u>1</u>
<u>CHAPTER 01 MOBILE AGENT</u>	
<u>1 INTRODUCTION</u>	<u>3</u>
<u>2 AN AGENT</u>	<u>3</u>
<u>3 THE AGENT'S PROPERTIES THE AGENTS ARE:</u>	<u>3</u>
<u>4 AGENT COMMUNICATION</u>	<u>3</u>
4.1 AGENT COMMUNICATION LANGUAGES	4
4.1.1 KQML	4
4.1.2 KIF	4
4.1.3 FIPA ACL	4
<u>5 DEFINITIONS</u>	<u>4</u>
5.1 A MOBILE AGENT	4
5.2 AGENT SERVER (AGENCY)	5
5.3 MOBILE AGENTS SYSTEM	5
<u>6 THE IDEA OF MOBILE AGENT</u>	<u>5</u>
<u>7 REASONS TO START USING MOBILE AGENTS</u>	<u>5</u>
<u>8 APPLICATIONS</u>	<u>6</u>
<u>9 ARCHITECTURE OF MOBILE AGENT</u>	<u>7</u>
<u>10 STRUCTURE OF MOBILE AGENTS</u>	<u>8</u>
<u>11 THE LIFECYCLE MODEL</u>	<u>9</u>
<u>12 COMPARISON BETWEEN CLIENT-SERVER PARADIGM AND MOBILE AGENTS PARADIGM</u>	<u>10</u>
12.1 CLIENT-SERVER PARADIGM:	10

12.2	MOBILE AGENTS AS A NEW DESIGN PARADIGM:	12
13	<u>MOBILE AGENT MIGRATION PROCESS</u>	12
14	<u>MIGRATION STRENGTH</u>	14
14.1	WEAK MOBILITY	14
14.2	STRONG MOBILITY	14
15	<u>REQUIREMENT ANALYSIS OF COMMUNICATION BETWEEN MOBILE AGENTS</u>	15
15.1	LOCATION TRANSPARENCY	15
15.2	RELIABILITY	15
15.3	EFFICIENCY	15
15.4	ASYNCHRONY	16
15.5	ADAPTABILITY	16
16	<u>MOBILE AGENT FRAMEWORK</u>	17
16.1	AGLET	17
16.2	AGENT TCL	17
16.3	ARA	18
16.4	CONCORDIA	18
17	<u>CONCLUSION</u>	19
 <u>CHAPTER 02 XML EXTENSIBLE MARKUP LANGUAGE</u>		
1	<u>INTRODUCTION</u>	21
2	<u>DEFINITION</u>	21
3	<u>A BRIEF HISTORY OF XML</u>	21
3.1	SGML AND XML'S EVOLUTION	21
4	<u>WHAT XML IS GOOD FOR?</u>	22
4.1	CLASSIFYING INFORMATION	22
4.2	ENFORCING RULES ON YOUR DATA	22
4.3	OUTPUTTING INFORMATION IN A VARIETY OF WAYS	23

4.4	USING THE SAME DATA ACROSS PLATFORMS	23
5	WHAT XML IS NOT ?	23
5.1	IT IS NOT JUST FOR WEB PAGES ANYMORE	23
5.2	IT IS NOT A DATABASE	23
5.3	IT IS NOT A PROGRAMMING LANGUAGE	23
6	XML SYNTAX	23
6.1	TAGS	23
6.2	ELEMENTS	24
6.2.1	SYNTAX	25
6.3	ATTRIBUTES	26
6.3.1	SYNTAX	26
6.4	DECLARATIONS	26
6.5	PROLOG	26
6.5.1	THE XML DECLARATION	26
6.6	PROCESSING INSTRUCTIONS	27
6.7	COMMENTS	27
6.8	CDATA	28
6.9	ENTITY REFERENCES	29
6.10	WHITE SPACE	29
7	SCHEMAS AND XML DATA MODELING	29
7.1	DOCUMENT TYPE DEFINITIONS (DTDs)	29
7.1.1	WHEN TO USE A DTD?	29
7.1.2	WHEN NOT TO USE A DTD?	30
7.1.3	DTD'S SYNTAX	30
7.1.4	TYPES OF DTD	33
7.2	XML SCHEMAS (XSDs)	34
7.2.1	ELEMENT DECLARATIONS	36
7.2.2	ATTRIBUTE DECLARATIONS	36
7.2.3	WHITE SPACE	37
7.2.4	DATATYPE DECLARATIONS:	38
7.2.5	NOTATIONS	39
7.2.6	ANNOTATIONS	40
7.2.7	DECIDING WHEN TO USE A SCHEMA:	40
7.3	COMPARING DTDs AND XSDs	40
8	INTRODUCING A WELL FORMED XML DOCUMENT	41

8.1	<u>RULES OF AN XML DOCUMENT</u>	41
9	<u>INTRODUCING VALID XML</u>	42
10	<u>XML PARSING LANGUAGES</u>	42
10.1	<u>XPATH</u>	42
10.2	<u>XQUERY</u>	42
11	<u>DOM</u>	43
12	<u>SAX</u>	43
13	<u>CONCLUSION</u>	44
 <u>CHAPTER 03 CONTRIBUTION</u>		
1	<u>INTRODUCTION</u>	44
2	<u>THE TOOLS USED</u>	44
2.1	<u>NETWORK SWITCH</u>	44
2.2	<u>AGLETS</u>	44
2.3	<u>JAVA</u>	45
2.4	<u>NETBEANS</u>	45
2.5	<u>MYSQL</u>	45
3	<u>WORK'S DESCRIPTION</u>	45
4	<u>ORGANIGRAM</u>	46
5	<u>THE ALGORITHM</u>	47
5.1	<u>OUR ANALYSIS ALGORITHM</u>	49
5.1.1	<u>DTD INTERNAL OR EXTERNAL CASE</u>	50
5.1.2	<u>SCHEMA CASE</u>	50
6	<u>APPLICATIVE EXAMPLE</u>	51
7	<u>CONCLUSION</u>	53
	<u>GENERAL CONCLUSION</u>	54

Agent technology has evolved from two research areas: Artificial Intelligence and Distributed Computing. The purpose of AI research is to use intelligent computing entities to simplify human operations. An agent is just a computer program targeting that purpose. Distributed Computing, on the other hand, allows a complex task to be better executed by cooperation of several distributed agents on inter connected computers. So, networking and distribution bring out the true flavor of software agent technology in terms of agent autonomy, coordination, reactivity, heterogeneity, brokerage, and mobility.

A mobile agent is a specific form of mobile code and has the features of mobility, autonomy, adaptability, and collaboration. It provides a paradigm and a powerful tool for implementing various applications in a computer networking environment. Over the past decades, the mobile agent technology has attracted a lot of attention from researchers and practitioners, thus leading to the development of theories, algorithms, systems, and platforms. Mobile agents indeed provide a means to complement and enhance existing technology in various application areas, such as information, e-commerce, parallel/distributed processing, network management, distributed data mining, event detection, and data aggregation in wireless sensor networks.

In this context, we developed an application that allows users to analyze an xml document using mobile agents.

XML is short for Extensible Markup Language which enables information to be encoded with meaningful structure and in a way that both computers and humans can understand. It is excellent for information exchange, and is easily extended to include user-specified and industry-specified tags. Because XML is formatting-free, it can be used in a variety of processes. It can replace or work with other technologies, and it can be used instead of or to supplement scripts. It also works with databases or on its own to store readable content.

A variety of APIs for accessing XML have been developed and used, and some have been standardized. Existing APIs for XML processing tend to fall into these categories:

- Stream-oriented APIs accessible from a programming language, for example SAX and STAX.
- Tree-traversal APIs accessible from a programming language, for example DOM.
- XML data binding, which provides an automated translation between an XML document and programming-language objects. Example data binding systems that include the Java Architecture for XML Binding (JAXB) and XML Serialization in .NET.
- Declarative transformation languages such as XSLT and XQuery.

Our manuscript is organized in 3 chapters. The first chapter, deal with software agents and mobile agents. The second one is about the XML document. The Third chapter presents the conception of our application and results obtained.

CHAPTER I
MOBILE AGENT

analysis syntactic or Parsing is the process of analyzing a string of symbols, either in natural language or in computer languages, conforming to the rules of a formal grammar; Syntactic analysis, or parsing, is needed to determine if the series of tokens given are appropriate in a language that is, whether or not the sentence has the right shape/form. However, not all syntactically valid sentences are meaningful, further semantic analysis has to be applied for this. For syntactic analysis, context free grammars and the associated parsing techniques are powerful enough to be used this overall process is called parsing.

In syntactic analysis, parse trees are used to show the structure of the sentence, but they often contain redundant information due to implicit definitions (e.g., an assignment always has an assignment operator in it, so we can imply that), so syntax trees, which are compact representations are used instead.

Analyzing a document using mobile agents was not used before, but in our application we developed an application that can analyze an xml document using mobile agents by searching in local network (LAN) for a specific XML document, then analyze it using a parsing algorithm that devise the document into tokens, than take the result and put it in a list, after that we transform it to relational database.

In this application we cross with some problems, like the aglets, which was a little be difficult because it was the first time dealing with agents, so it take time to use to it.

The developed application could just find the XML document when we specific the hosts. As a future work we propose that the agent can migrate from host to another host until it find the XML document. Besides this, we have developed a schema grammar but it is a little bit small, as a perspective, our application can be ameliorated to manipulate the XML schema in more details.

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ملخص

العوون المتنقل هو مجموعة برامج ومعطيات التي تهجر من حاسوب الى اخر بطريقة مستقلة مع مواصلة التنفيذ في الحاسوب الاخر، لأجل هذا السبب نستعمله لتحليل ملفات XML. وفي هذا السياق، طورنا برنامج يسمح للمستخدمين باستخراج المعلومات من ملفات XML بواسطة العوون المتنقل. الكلمات المفتاحية: العوون المتنقل، XML، تحليل، هجرة.

Abstract

A mobile agent is a composition of computer software and data, which is able to migrate from one computer to another autonomously and continue its execution on the destination computer. For this reason, we use it to analyze an XML document. To perform this task, we have developed an application that allows users to extract information from an XML document using mobile agents.

Key words: mobile agent, XML, analyze, migration.

Résumé

Un agent mobile est une composition de programmes et de données qui est capable de migrer d'un ordinateur à un autre de manière autonome et continue son exécution dans l'ordinateur de destination. Pour cette raison nous l'avons utilisé pour analyser un document XML. Afin d'accomplir cette tâche, nous avons développé une application qui permet aux utilisateurs d'extraire des informations d'un document XML par le biais d'agents mobiles.

Les mots clés : Agent mobile, XML, analyse, migration.