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Reinforcement Learning for VMs Cluster in VMs Failures Cloud Computing

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Abstract: Job scheduling is a necessary prerequisite for performance optimization and resource management in the cloud computing system.
In existing system the architecture of cloud computing platform and optimization job scheduling scheme is done. The system model is comprised of clearly defined separate constituent parts, including portal, job scheduler, and resources pool. VMs failures, VMs migration, costs of communication, burst arrivals of requests, and VMs cluster are not considered. In proposed system reinforcement learning is used to study about VMs failures, VMs migration, costs of communication, burst arrivals of requests, and VMs cluster. Through this learning it overcomes these issues
Keywords: Reinforcement Learning, VMs, Job Scheduling, Cloud Computing, Cluster.

I. INTRODUCTION

Though job scheduling in cloud computing is quite similar to dispatching in the traditionally distributed environment, there are significant differences between them.

1) *Dynamics*: Cloud resources change dynamically, with new Virtual Machine (VM) resources joining the cloud computing system and the existing ones exiting at any time, job scheduling scheme is supposed to be real-time monitoring of the changes of resources in a cloud computing environment; correspondingly, the computing resources scaled to schedule the jobs in the traditional distributed environment are fixed.
2) *Heterogeneity*: The resources in the cloud computing environment are heterogeneous and diverse, which shield the differences amid resources through proven virtualization technology. The cloud computing system integrates resources into a unified logical resource pool, and offers external services. While in a traditional distributed environment, the computing resources are isomorphic. In addition, unlike the specific scheduling schemes for particular applications in a traditional distributed environment, the cloud computing job scheduling scheme, not limited to specific applications, can support multiple types of applications and can run them simultaneously.
3) *Complexity*: The target in job scheduling under the traditional distributed environment is relatively simple, for it is merely focused upon the job completion time and the overall performance (such as the system throughput). While in the cloud computing environment, not only does the job scheduling strategy aim to increase the possible revenue for service providers, but also tries to meet the various application requirements for the resources and varied objectives of scheduling jobs.

A. Proposed Algorithm

In proposed algorithm the reinforcement learning is used to study about VMs failures, VMs migration, costs of communication, burst arrivals of requests, and VMs cluster. Through this learning it overcomes these issues .

1) *Focal Point*
a) VMs failures are mitigated.
b) VMs migration doesn't affect the data.
c) costs of communication is decreased.
d) burst arrivals of requests are easily handled.
e) VMs cluster are considered.

II. ENVIRONMENT DETAILS

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use.

1) *Software Specification*
a) Front end = java 8 and above
b) Back end = mysql 5 and above
c) Tool   = netbeans 8.0 and above

2) *Hardware Specification*
a) Processor = intel i3 and above
b) Ram   = 4 gb and above
c) Hard disk = 250 gb and above

A. *System Architecture*
1) *Constructing VMs Cluster*
a) Virtual machine clusters are constructed.
b) Agents register their resources with cloud service providers.
c) Joining and disconnection policy are maintained.
d) Job scheduling is done.

2) *Reinforcement Learning FOR VMs Failured*
a) Continuous monitoring for virtual machine is done.
b) If any failures occurs alert will be sent.
c) Reason for failures are learnt.
d) Predict future failures with heuristics.
e) this alternate node will be a healthy node but remain silent until its necessary to utilize it.

3) *Organized VMs Migration*
a) Virtual machine migrations are organized.
b) resources joining the cloud computing system and the existing ones exiting at any time are monitored.
c) Vm migration will be done in both scenario
d) This will be handled after verification of jobs processed status.

4) *Miitigating Cost of Communication*
a) The cost of communication is reduced through priority scheduling of jobs.
b) The cluster chosen for bulk data will be trustworthy.
c) The cluster with long availability will be considered as trustworthy clusters.
d) This greatly reduce cost of communication

5) *Handling Burst Arival of Request*
a) Burst arrival of requests are handled by queuing clusters.
b) The policies will be done with the cluster for emergency scheduling of requests.
c) Through this a sudden burst arrival of requests will be assigned to that queued clusters.
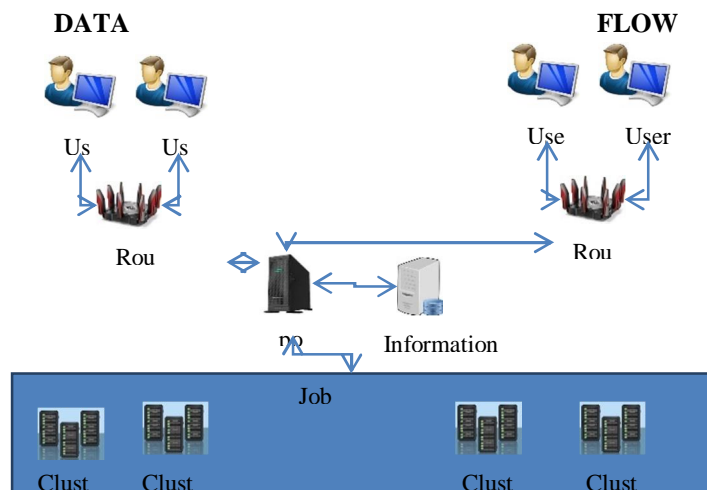
B. Software Overview

Java is a platform Independent. Java is a high level programming language Introduced by Sun Microsystems in June 1995 Java is becoming a standard for Internet Applications. It provides for interactive processing and for the use of graphics and animation on the Internet. Since the Internet consists of different types of computers and operating systems, a common language was needed to enable computers to run programs that run on multiple platforms. Java is an object oriented language built upon C and C++.It derives its syntax from C and its object-oriented features are influenced by C++. Java can be used to create applications and applets. An application is a program that runs on the user's computer, under its operating system. An applet is a small window based program that runs on HTML page using Java enabled browser like Internet Explorer, Netscape Navigator, Hot Java or an applet view

1) Features of Java

Simple

a) Java Language constructs are easy to learn and use. It takes care of memory management. Though

b) Java was developed from C++, the complexities associated with C++ have been eliminated in Java.

2) Object-Oriented: Java is designed around the object-oriented model. In Java the focus is on the 'data' and the 'methods' that operate on the data in an application and not just on the procedures. The data and methods together describe the state and the behavior of an object in Java.

3) Robust: Java is a robust language since it has strict compile time and run time checking of code. This minimizes programming errors. Error handling and recovery is taken care of in Java by the 'exception- handling' feature.

4) Secure: Java is language that focuses on the network. Java security features ensure that its programs that run are safe. Programmers cannot manipulate memory in Java. This is a good defense mechanism against malicious code that may flow in from the network. Java programs running on the Web cannot open, read, write or delete files on the user's system or run other programs on it.

5) Distributed: Java can be used to develop applications that are portable across multiple platforms, operating systems and graphical user interfaces. Java is designed to support network applications. Thus Java is widely used tool in an environment like the Internet where there are different platforms.

6) Multithreaded: Java programs can do many tasks simultaneously by a process called 'multithreading'. Java provides the master solution for synchronizing multiple processes. Therefore, interactive applications on the Net can run smoothly. This is made possible by the built-in support for threads.

a) Running Java File with single command

b) New utility methods in String class

c) Local-Variable Syntax for Lambda Parameters

d) Nested Based Access Control

e) HTTP Client

f) Reading/Writing Strings to and from the Files

g) Flight Recorder

C. Technology Infrastructure

1) *Core Java:* Java can be used to create two types of programs: application and applet. An application is a program that runs on your computer, under the operating system of that computer. That is, an application created by java is more or less like one created using C or C++. When used to create application, java is not much different from any other computer language. Rather, it is java's ability to create applets that makes it important. An applet is an application designed to be transmitted over the internet and executed by a java-compatible Web Browser. An applet is actually a tiny java program, dynamically downloaded across the network, just like an image, sound file, or video clip. The important difference is that an applet is an intelligent program, not just an animation or media file. In other words, an applet is a program that can react to user input and dynamically change-not just run the same animation or sound over and over.

D. Developing Mythologies

The test process is initiated by developing a comprehensive plan to test the general functionality and special features on a variety of platform combinations. Strict quality control procedures are used. The process verifies that the application meets the requirements specified in the system requirements document and is bug free. The following are the considerations used to develop the framework from developing the testing methodologies.

III. CONCLUSION

In light of the proposed system model theoretically analyze the execution process of jobs in cloud computing environment. Further the system design a novel job scheduling scheme using reinforcement learning to optimize the make span and AWT under given VM resources. The system evaluate the proposed job scheduling optimization schemes in extensive simulations.

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