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PERFORMANCE EVALUATION OF DYNAMIC ENCRYPTION ON REAL CLOUDS OF IBM BLUEMIX AND REDHAT OPENSHIFT

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ABSTRACT

Cloud computing is one of the key domain of research and in use for delivery for assorted computing services including telecommunications, storage, platforms, software, virtual infrastructure and many others. Cloud computing offers the delivery of virtual resources without need to worry on establishing and maintaining the actual infrastructure. The end user of cloud services access the remote computing resources using web based client without having very complex configuration in their own device. A person having 1 GB RAM in their own device can work on the 128 GB RAM installed at cloud server without any issue. That's where the performance of cloud comes to the imagination. In this case, the system or device of user acts as the terminal to access and work on the remote cloud infrastructure. There are number of cloud service providers which can be used for assorted computing infrastructure and applications. This

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research work focus on the effective evaluation of assorted cloud service providers and cloudsim based on various factors. In this work, the effective implementation of assorted algorithms and sentiment opinion mining is done on the real as well as simulator based clouds. Sentiment Data Analysis is one of the prominent and widely used domains by the research scholars and practitioners. In this approach, there are number of tools and technologies available for fetching the live datasets, tweets, emotional attributes. Using these tools, the real time tweets and messages can be extracted from Twitter, Facebook, WhatAapp and many other social medial portals.

Keywords – Cloud Computing, Sentiment Mining, Real Cloud

INTRODUCTION

Cloud computing is a unique and effective way to use the computing infrastructure for effective communication and less overhead. "The major technology behind grid as well as cloud computing is the virtualization technology. Using virtualization technology, the number or arbitrary and remote processors works in parallel for the execution of tasks in such a way that there is less complexity and higher integrity of the processes.

In cloud and grid architecture, there are number of remote computing devices and processors which work and execute the processes in parallel so that there is minimum load on the single node or machine. By this way, the overall load is balanced.

There are number of research areas in the domain of grid computing and cloud computing, still few areas are still in the preferences of the research community as these areas needs updations and enhancements in regular basis.

The major areas of research in grid and cloud architecture are -

- Load Balancing
- Power Optimization
- Energy Optimization
- Secured Routing
- Task Scheduling
- Confidentiality and Integrity Management
- Public and Private Key Cryptography ….. and many others

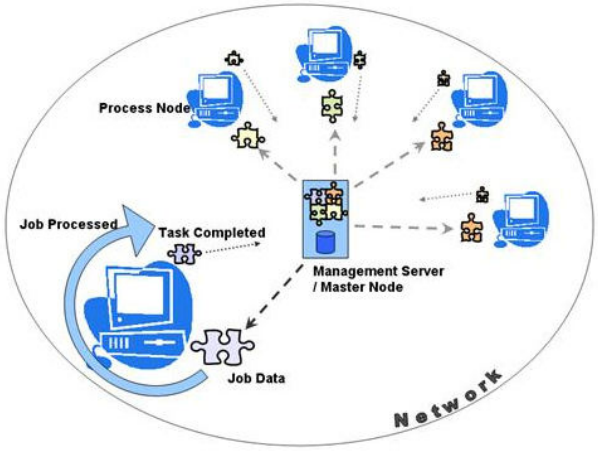

Figure 1.1 - Grid Computing Architecture and Working Model [1]

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VIRTUALIZATION TECHNOLOGY

Virtualization technology is back bone in the grid and cloud platforms for effective management of the systems on demand for the jobs under execution. Using virtualization, there is no need of deployment of the dedicated systems or no0064es, rather the virtual machines take charge of all the operating system, platform and the resources to be used.

Virtual machines are classified into the two major taxonomies which depend on their usage and the degree of communication -

- **System Virtual Machine** – This system provides the full system environment to support the processes and execution of operating system in use.
- **Process Virtual Machine.** It is also called as Language Virtual Machine**.** Such machine is deployed and designed to process a single task or job or simply program. It means that it is dedicated for a single process.

Key Virtualization Technology Based Software Suite in the Corporate World

- **Windows as Host OS**
  - VMWare Workstation (Any Guest OS)
  - Virtual Box (Any Guest OS)
  - Hyper-V (Any Guest OS)
- **Linux as Host OS**
  - VMWare Workstation
  - Microsoft Virtual PC
  - VMLite Workstation
  - VirtualBox
  - Xen

Hypervisor Type 1 Software Suite

- VMWare ESXi
- Citrix Xen
- KVM (Kernal Virtual Machine)
- Hyper-V

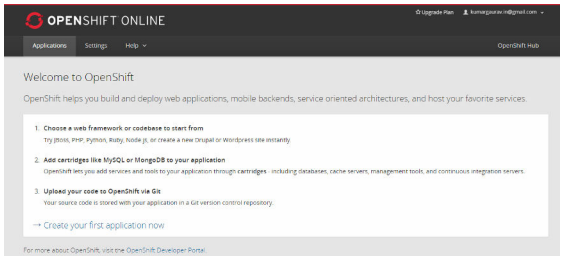
Hypervisor Type 2 Software Suite

- VMware Workstation
- VirtualBox

CREATING PHP APPLICATION PAGE IN RED HAT OPENSHIFT

OpenShift (http://www.openshift.com) is gained a lot of popularity with developers as it is having the enormous speed by which the quick spinning up a new development stack is possible.

To start using the OpenShift platform, the very first step a developer requires is an account that provides access to create and deploy applications.



After creating the new account, there is the option to create a new application. In the online platform, the complete code can also be uploaded using Git so that

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the pre-built application can be launched on OpenShift Platform.

To work on a new application, the OpenShift platform presents the number of options which are in the interest of developer to use. If a Python application is to be developed, the OpenShift gives the platform to program and execute Python Code online.

After basic settings and selection of the public URL, a new application is created on which the code can be deployed and executed.

The changes in the existing code can be done using Git. For this Git tool is required to be installed so that that the modifications and uploading can be done.

In OpenShift, the creation and deletion of application is very easy. The earlier created application can be deleted anytime after use.

Methodology Used

- Development of a Novel and Effective Algorithmic Approach
- Implementation of Algorithm in Advance Java
- Implementation of Approach on Real Clouds
    - IBM Bluemix
    - RedHat OpenShift
- Fetch Results
- Comparative Analysis of the Results on multiple parameters
    - Cost Factor
    - Complexity
    - Execution Time
    - Performance
- Data Interpretation

Table 1 – Comparative Analysis on Assorted Parameters

	Cost	Complexity	Execution Time (ms)	Performance
IBM Bluemix	79	58	0.2324674	89
RedHat OpenShift	68	48	0.13838398	96

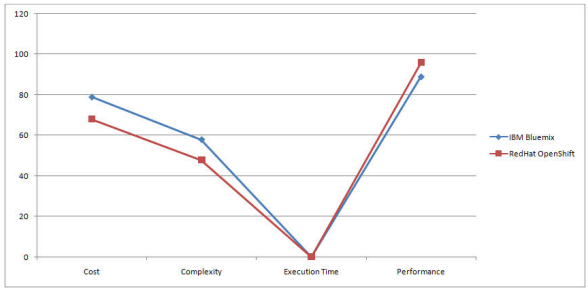

Figure 1 – Comparative Analysis

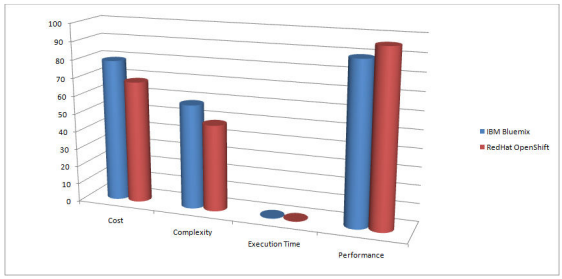

Figure 2 – Bar Graph of Comparative Analysis

Many social networks and apps have their own interface that programmers can work with. "These

interfaces are called APIs (short for Application Programming Interface).

Following is the results of Twitter-Java integration

```
/**
 * This Class is used to get the list of status.
 */
import java.util.*;
import twitter4j.*;
import twitter4j.Status;
import twitter4j.TwitterFactory;
import twitter4j.conf.ConfigurationBuilder;

public class Keyword {
        public static void main(String[] args)
throws TwitterException {

 ConfigurationBuilder cf=new
ConfigurationBuilder();
 cf.setDebugEnabled(true)

.setOAuthConsumerKey("56dgm39RKf2Mk64maypJ4
LzWb")

.setOAuthConsumerSecret("CT9RNduvafznnI5Gbqse
7kVlJSw3e55z1jkkbnMzqiqzjT7d2U")
 .setOAuthAccessToken("96367691-
TEJPMXkf7HqTHVVD7SJ3Xeu8zHikKbCFNGNAgU
tv7")

.setOAuthAccessTokenSecret("QTMDSl5udT8ux2LtZ
wbe849Kg8P8K0MZfd6PNW4bTOWhd");

 TwitterFactory tf=new TwitterFactory(cf.build());
 twitter4j.Twitter twitter = tf.getInstance();

 // The factory instance is re-useable and thread safe.
//   Twitter twitter = TwitterFactory.getSingleton();
   // requesting page 2, number of elements per page
is 40
   Paging paging = new Paging(2, 40);
   List<Status> status =
twitter.getUserTimeline(paging);
   for (Status st : status) {

System.out.println(st.getUser().getScreenName() +
":" + st.getText());
   }

   // requesting page 3, since_id is (long)1000
/*    statuses = twitter.getUserTimeline(new
Paging(3).sinceId(1000l));
   for (Status status : statuses) {

System.out.println(status.getUser().getScreenName()
+ ":" + status.getText());
   }
          */
}
}
/**
 * This Class is used to get the list of status.
 */
import java.util.*;
import twitter4j.*;
import twitter4j.Status;
```

```
import twitter4j.TwitterFactory;
import twitter4j.conf.ConfigurationBuilder;

public class FirstTwitterApp {
        public static void main(String[] args)
throws TwitterException {

 ConfigurationBuilder cf=new
ConfigurationBuilder();
 cf.setDebugEnabled(true)

.setOAuthConsumerKey("56dgm39RKf2Mk64maypJ4
LzWb")

.setOAuthConsumerSecret("CT9RNduvafznnI5Gbqse
7kVlJSw3e55z1jkkbnMzqiqzjT7d2U")
 .setOAuthAccessToken("96367691-
TEJPMXkf7HqTHVVD7SJ3Xeu8zHikKbCFNGNAgU
tv7")

.setOAuthAccessTokenSecret("QTMDSl5udT8ux2LtZ
wbe849Kg8P8K0MZfd6PNW4bTOWhd");

 TwitterFactory tf=new TwitterFactory(cf.build());
 twitter4j.Twitter twitter = tf.getInstance();

 List<Status> status=twitter.getHomeTimeline();
for (Status st : status)
 {

        System.out.println(st.getUser().getName()+"
-----"+st.getText());
 }
        }
}
```

CONFIGURATION OF TWITTER4J

Twitter4J is an unofficial Java library for the Twitter API.

With Twitter4J, you can easily integrate your Java application with the Twitter service. Twitter4J is an unofficial library.

Twitter4J is having following features -

- 100% Pure Java - works on any Java Platform version 5 or later
- Android platform and Google App Engine ready
- Zero dependency : No additional jars required
- Built-in OAuth support
- Out-of-the-box gzip support
- 100% Twitter API 1.1 compatible

Generic properties

There are a number of properties available for configuring Twitter4J. You can specify properties via twitter4j.properties file, ConfigurationBuilder class or System Property as follows : -

via twitter4j.properties

Save a standard properties file named "twitter4j.properties". Place it to either the current directory, root of the classpath directory.

debug=true

*oauth.consumerKey=**********
oauth.consumerSecret=**********
****
oauth.accessToken=**********
****
oauth.accessTokenSecret=**********
****
via ConfigurationBuilder
You can use ConfigurationBuilder class to configure Twitter4J programatically as follows:
ConfigurationBuilder cb = new ConfigurationBuilder();
cb.setDebugEnabled(true)

.setOAuthConsumerKey("**********")

.setOAuthConsumerSecret("**********
**********")

.setOAuthAccessToken("**********
**********")

.setOAuthAccessTokenSecret("**********
**********");
TwitterFactory tf = new TwitterFactory(cb.build());
Twitter twitter = tf.getInstance();
via System Properties
You can configure Twitter4J via System properties as well. Note that you need "twitter4j." prefix.
$ java -Dtwitter4j.debug=true
-Dtwitter4j.oauth.consumerKey=**********
****
-Dtwitter4j.oauth.consumerSecret=**********
****
-Dtwitter4j.oauth.accessToken=**********
****
-Dtwitter4j.oauth.accessTokenSecret=**********
****
-cp twitter4j-core-4.0.4.jar:yourApp.jar yourpackage.Main*

via environment variables

You can configure Twitter4J via environment variables as well. Note that you need "twitter4j." prefix. This makes it easier to test, stage and deploy apps running on Heroku.

*$ export twitter4j.debug=true
$ export twitter4j.oauth.consumerKey=**********
***
$ export twitter4j.oauth.consumerSecret=**********
****
$ export twitter4j.oauth.accessToken=**********
****

*$ export twitter4j.oauth.accessTokenSecret=**********
****
$ java -cp twitter4j-core-4.0.4.jar:yourApp.jar yourpackage.Main*

On Heroku:

*$ heroku config:add oauth.consumerKey=**********
$ heroku config:add oauth.consumerSecret=**********
$ heroku config:add oauth.accessToken=**********
****
$ heroku config:add oauth.accessTokenSecret=**********
****
$ git push heroku master*

CONCLUSION AND FUTURE WORK

Now days, most of computing services are available on demand which are hosted by number of cloud service providers. There are number of domains and key areas in cloud computing which are under research from a long time due to escalating need and applications of digital services.

As a result of the advances in the innovation, the issues and further extension in science and building are turning out to be more convoluted than any time in recent memory. To tackle these muddled issues, network figuring turns into a well known apparatus. A framework domain gathers, coordinates, and uses heterogeneous or homogeneous assets scattered the world over by a rapid system. A lattice situation can be ordered into two sorts: processing networks and information frameworks. This exploration work concentrates on employment booking calculations and their execution on numerous parameters in the lattice environment. In processing matrix, occupation booking is a critical undertaking. A decent booking calculation can allocate occupations to assets productively and can adjust the framework load.

For future scope of the work, following techniques can be used in hybrid approach to better and efficient results –

- Particle Swarm Optimization
- HoneyBee Algorithm
- Simulated Annealing
- Genetic Algorithmic Approaches

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