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Web Based RPM Package Monitoring And Comparision System For Linux Servers

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Abstract — *This system will automate the complex and manual tasks of system administrator related migrating source code to production systems. This system will capture software version of all installed packages to compare RPMs, version, release & stores this information in centralized database repository for historical analysis providing report to administrator for analysis. Using this, report administrator will take the decision regarding provision of RPMs. providing excellent cost-efficiencies; Red Hat clustering is great for any business that cannot tolerate disruption or damage to their brand due to downtime or technical issues.*

Keywords- *Change Management system, RPM Package, Linux servers, Syncing, Monitoring, Comparison, Database.*

I. INTRODUCTION

To an outside user accessing a hosted service (such as a website or database application), a Linux Virtual Server (LVS) cluster appears as one server. In reality, however, the user is actually accessing a cluster of two or more servers behind a pair of redundant LVS routers that distribute client requests evenly throughout the cluster system. Load-balanced clustered services allow administrators to use commodity hardware and Red Hat Enterprise Linux to create continuous and consistent access to all hosted services while also addressing availability requirements. An LVS cluster consists of at least two layers. The first layer is composed of a pair of similarly configured Linux machines or cluster members. One of these machine acts as the LVS routers, configured to direct requests from the Internet to the cluster. The second layer consists of a cluster of machines called real servers. The real servers provide the critical services to the end-user while the LVS router balances the load on these servers.

Motivation: Motivation of choosing this project was to build an automated application to install all the required RPMs in the cluster nodes with no downtime between the servers.
Objective: Our system provides automation in complex and manual tasks of system administrators. It also provides syncing facility. Tasks performed by our system are stored in database for historical analysis.
Load balancing Linux server cluster:-

- Our system is a web based RPM package monitoring and comparison system for test and production Linux servers. Data Centers of any financial organization in India is mandated by the RBI to have a development, testing and production environment. Our system provides automation in comparing database schemas as well as syncing facility. The proposed system will automate the complex and manual tasks of system administrators related migrating source code to production systems. Change management procedures can be followed to migrate software application code from testing to production server.

II. RELATED WORK

- The number of systems to automate the complex and manual tasks of system administrator related migrating source code to production systems are proposed and implemented by using different techniques and methods, Our review in this area shows that, there are not many systems developed using change management system.
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- Sebastian Hagen, Weverton Luis da Costa [1] has efficiently detected harmful change operation and resolves them by using Partial-order reduction model checking paradigm and algorithm.
- Ioannis Stavrakakis, Azer Bestavros [2] propose an innovative approach to migrate, add, or remove servers within scope Network using Distributed algorithm.
- Cameron Dale [3] design leads to advance package tool-p2p, a practical implementation that extends the popular apt distributor using Peer to peer distribution, Downloading Protocol.
- Santa Rosa [4] designed to maintain time accuracy and reliability used over typical Internet paths using NTP build on internet protocol & user datagram protocol.
- Winchester Systems [6] introduces Linux based high availability clustering as a practical option for enterprises using RAID (redundancy) and Flash Disk.

- LAN Yu-Qing, DUAN Xiao-Gang, GAO Jing [7] has analyzed variety of different Linux package formats & extraction methods of several different formats of dependency relations are studied using Unified Package Metadata and XML.
- Daniel Burrows [8] have designedModel of dependency relationships, a restart able technique based on BFS to calculate resolutions using Solving Dependencies through Best-First Search.
- SRIKALA BHARDWAJ & MEGHA.P.ARAKERI [9] have consistently maintained installation, up gradation & removal of the software packages, using tool called package manager.

III. ARCHITECTURE OF THE SYSTEM

Our system consists of cluster having number of Linux servers. The servers in the cluster are interconnected through a private network switch. They collectively use a shared storage disc space through a SAN switch. These servers are called as Production servers and they act as slave servers. All production servers are monitored by a Testing server. Slave nodes are connected to public network via public network switch where number of clients can log in and perform their tasks. The architecture consists of a Master (or standard) node where the ideal RPMs are installed. YUM server is a central repository where all the RPM package setup files are available.

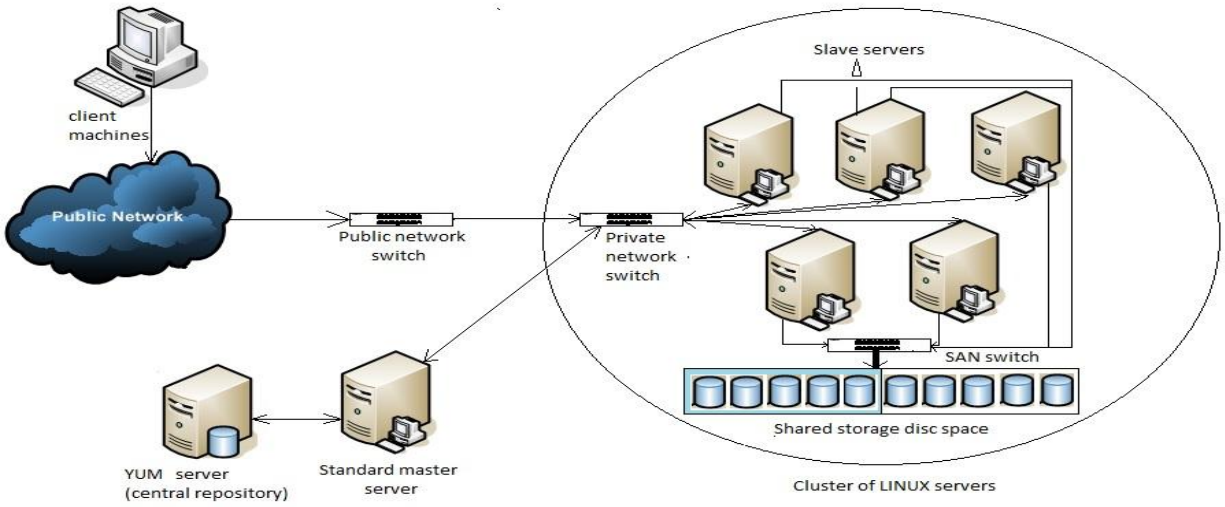

Fig. 1

IV. PROPOSED SYSTEM

Initially, system administrator logs in to the monitoring (or testing) server. Now administrator generates the private key and a public key on central monitoring server and copies those keys and sets up a Password less entry for production (slave) servers. Whenever Downtime occurs on any of the servers in the cluster, the cluster fails to work efficiently. To overcome such a downtime, our system performs following tasks:

- Our application captures the software names, software versions and software architecture of all installed packages on production servers and the standard master server.
- Compare these RPMs (Software), release, version, architecture of each installed package on the monitoring system.
- The packages which are installed on the master server but are not present on the production servers are fetched from the YUM repository along with their latest versions through pull operation.
- These packages are then installed on the production servers which in turn provide Syncing facility by installing or removing required RPM packages from respective servers done by push operations.
- Store all performed task information in a centralized database repository.
- This report is provided to System Administrator for analysis purpose.

Similarly, these actions will be performed whenever a new server node is added to the cluster. The new server will be synchronized with the existing servers by performing above tasks. All these steps and actions are stored in a database for historical analysis. This analysis will be used during the audit process.

V. MATHMATICAL MODEL

The system consist following mathematical set theory techniques:

S = {I, O, Sc, F, q0, q1, Functions}
q0: INITIAL STATE
Initial state will be one standard Linux server with all RPM packages on it and all other Linux servers with some RPM packages on them within a single cluster.
q1: FINAL STATE
Final state will be servers synchronized with the standard server in the cluster.
I: INPUT
I = {I1, I2, I3}
I1 = Name, Version and Architecture of the RPM packages of Standard Server
I2 = Name, Version and Architecture of the RPM packages of all other servers
O: OUTPUT
O = {O1}
O1 = I1 - I2
FUNCTIONS: {F1,F2,F3.F4,F4,F5,F6,F7,F7,F8,F9,F10,F11}
F1=sort()
F2=strcmp()
F3=getMasterNodeInfo()
F4=saveMasterNodeInfo()
F5=getMasterSoftwareInfo()
F6=saveMasterSoftwareInfo()
F7=pullNodeInfo()
F8=SaveNodeInfo()
F9=pullSoftwareInfo()
F10=SortSoftwareInfo()
F11=SaveSoftwareInfo()
Sc: SUCCESS
We get the difference between the packages available on the Standard server and all other remaining server and hence whole of the system is synchronized.
F: FAILURE
We could not obtain the difference between the packages available on Standard server and the other servers.

VI. ADVANTAGES AND DISADVANTAGES

- Boosts productivity through increased uptime at production server.
- Provides the stable and automated production environment.
- Historical analysis of database can be used for audit process.
- The system will provide High performance compute (HPC) in Linux clustering.
- Syncing facility will be new term for clusters of Linux server.
- Minimal business disruptions for mission critical systems.
- Network related issues can cause problem for system.
- System needs Experienced person to handle, because production line area is critical where number of clients logs in to perform their tasks in information technology industries
- Cost is high as system works with production line.

VII. SUMMARY AND CONCLUSION

The proposed product or application is for RPM software installation, it will take names, version and architecture of that software's as an input; it will contain various modules which will perform comparison and synchronization of production servers and testing server.
Our software application can be used where there is need to avoid downtime between the servers in the cluster and also when a new node is added to the cluster. Our system has its application in IRCTC, Banking systems, IT sectors, etc.

REFERENCES

[1] Sebastian Hagen, Member, IEEE, Weverton Luis da Costa Cordeiro, Member, IEEE, Luciano Paschoal Gaspary, Member, IEEE, Lisandro Zambenedetti Granville, Member, IEEE, and Alfons Kemper "Model checking of IT change operation".

[2] Georgios Smaragdakis, Nikolaos Laoutaris, Konstantinos Oikonomou, Member, IEEE,Ioannis Stavrakakis, Fellow, IEEE, and Azer Bestavros "Server Migration for Scalable Internet Service Deployment".

[3] Cameron Dale School of Computing Science Simon Fraser University Burnaby, British Columbia, Canada Jiangchuan Liu School of Computing Science Simon Fraser University Burnaby, British Columbia, Canada "A Peer-to-Peer Distribution System for Software Package Releases and Updates".

[4] Santa Rosa, "Introduction to NTP", CA, USA.

[5] "Low Cost High Availability Clustering for the Enterprise",Jointly published by Winchester Systems Inc. and Red Hat Inc.

[6] LAN Yu-Qing, DUAN Xiao-Gang, GAO Jing, ZHOU Wen-Bin, ZHAO Hui School of Computer Science and Technology, Beihang University, Beijing 100191, China, "Extraction Methods on Linux Package Dependency Relations".

[7] Daniel Burrows dburrows@debian.org "Modelling and Resolving Software Dependencies" June 15, 2005.

[8] SRIKALA BHARADWAJ, 2MEGHA.P.ARAKERI 1, Information Science Department, MSRIT, "A SURVEY OF LINUX METADATA PACKAGE MANAGEMENT SYSTEMS AND THEIR SOLVERS". Bangalore

[9] Nat. Electron. & Comput. Technol. Center, Pathumthani, Thailand Issariyapat, C. ; Pongpaibool, P. ; Meesublak, K. ; Nulong, N. ; "A management system for software package distribution**".**

[10] Reberto Di Cosmo, Stefano Zacchiroli, Paulo Trezentos, in ACM Conference on Object-Oriented Programming: System, Languages, and Applications (OOPSLA), "Package upgrades in FOSS distributions: details and challenges," 2008.

