iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 7 **Issue:** V **Month of publication:** May 2019

DOI: https://doi.org/10.22214/ijraset.2019.5043

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.177
Volume 7 Issue V, May 2019- Available at www.ijraset.com

Cluster computing using Raspberry PI -3 with Python Programming

Mr. Raghvendra Omprakash Singh[1], Mr. Bagave Yogesh Parshuram[2], Mr. Bagave Yogesh Parshuram[3], Miss. Khaire Shreya Rajendra[4], Miss. Patil Shweta Gajanan[5]
[1]*Assistant Professor,* [2, 3, 4, 5]*Computer Engineering Department, G.M Vedak Institute of Technology, Tala-Mumbai University. India.*

Abstract: ***This project aims on making a RaspberryPi primarily based cluster laptop which is able to be used for knowledge analytics. folks have become captivated with laptop and their procedure power a lot of and a lot of daily. Increasing quantity {of knowledge of knowledge of information} is coming back into existence every day and power to method this data concerns cluster laptop that area unit a group of laptop that operate along, solely to be viewed as one laptop, to method and figure knowledge. during this project, we tend to area unit making a miniature model of cluster laptop that area unit North American nationed on servers like windows server 2003 or fictitious character cluster victimization Raspberry Pi which is able to provide us an inspiration concerning the operating and power of cluster computers. Our main plan is to form a cluster laptop and supply the ability of knowledge analysis to demonstrate the facility of cluster computing and therefore the uses of knowledge analytics. This project will offer a less expensive different to teacher WHO desires teach their category concerning operating of a cluster and student WHO desires to create their own little cluster or need expertise however a cluster works or any trade personnel WHO desires to use the facility of cluster laptop.***

Focused crawl, Smart Crawlerranks websites to range extremely relevant ones for a given topic. within the second stage, sensible Crawler achieves quick in-site looking out by excavating most relevant links with AN adjustive link-ranking. To eliminate bias on visiting some extremely relevant links in hidden internet directories, we tend to style a link tree arrangement to realize wider coverage for an internet site. Our experimental results on a group of representative domains show the nimbleness and accuracy of our projected crawler framework, that expeditiously retrieves deep-web interfaces from large-scale sites and achieves higher harvest rates than different crawlers.

Keywords: Raspberry pi, Cluster, network.

I. INTRODUCTION

A laptop cluster may be a cluster of loosely coupled laptops that job along closely so in several respects it are often viewed as if it were one computer. Clusters area unit normally connected through quick native space networks. Clusters area unit typically deployed to enhance speed and/or dependableness over that provided by one laptop, whereas usually being way more cost-efficient than single computers of comparable speed or dependableness. Cluster computing has emerged as a results of convergence of many trends as well as the supply of cheap high performance microprocessors and high speed networks, the event of normal software system tools for top performance distributed computing. Clusters have evolved to support applications starting from ecommerce, to high performance information applications. during this paper we've got given style and of a cluster primarily based framework. The cluster implementation involves the planning of a server named MCLUSTER that manages the configuring, resetting of cluster. Framework handles- the generation of application mobile code and its distribution to acceptable consumer nodes. The consumer node receives and executes the mobile code that defines the distributed job submitted by MCLUSTER server and replies the results back. A laptop cluster may be a set of loosely or tightly connected laptop that job along so, in several respects, they'll be viewed as one system. in contrast to grid computers, laptop clusters have every node set to perform identical task, controlled and scheduled by software system. The elements of a cluster area unit typically connected to every different through quick native space networks, with every node (computer used as a server) running its own instance of AN OS. In most circumstances, all of the nodes use identical hardware]and identical OS, though in some setups (e.g. victimization Open Supply Cluster Application Resources (OSCAR)), completely different operational systems are often used on every laptop, or completely different hardware.

Clusters area unit typically deployed to enhance performance and availableness over that of one laptop, whereas usually being way more cost-efficient than single computers of comparable speed or availableness.

Computer clusters emerged as a results of convergence of variety of computing trends as well as the supply of low-priced microprocessors, high-speed networks, and software system for superior distributed computing. they need a good vary of pertinence and preparation, starting from little business clusters with one or two of nodes to a number of the quickest supercomputers within

©IJRASET: All Rights are Reserved

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.177
Volume 7 Issue V, May 2019- Available at www.ijraset.com

the world like IBM's redwood. before the arrival of clusters, single unit fault tolerant mainframes with standard redundancy were employed; however the lower direct value of clusters, and redoubled speed of network cloth has favoured the adoption of clusters. In distinction to high-reliability mainframes clusters area unit cheaper to scale out, however even have redoubled complexness in error handling, as in clusters error modes don't seem to be opaque to running programs.

Objectives bunch is that the task of dividing the population or knowledge points into variety of teams specified knowledge points within the same teams area unit a lot of almost like different knowledge points within the same cluster than those in different teams. In straightforward words, the aim is to segregate teams with similar traits and assign them into clusters.

II. EXISTING SYSTEM

Exisiting system needs immense quantity of human resources to try and do analysis and calcution to search out correct end in less time. supported manual or single server it need a lot of execution time. the present system want longer and additionally it's not moveable as immense because of immense C.P.U.

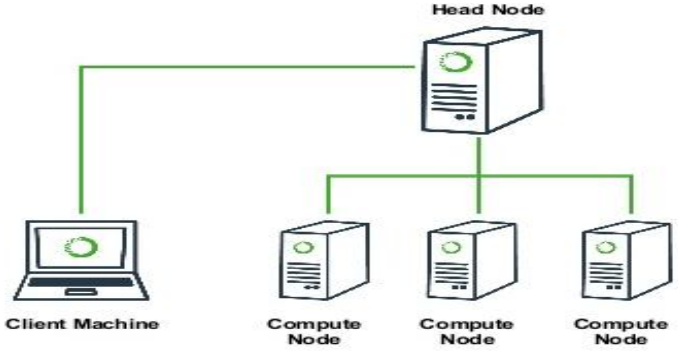
A. Problem Statement

1) Increase within the scientific disciplines has caused giant knowledge collections as vital community resources.
2) The volume of attention-grabbing knowledge is already measured in terabytes and can shortly total in peta-bytes.
3) Processing huge quantity of satellite knowledge is AN open question.
4) A single LEO satellite sends around a pair of GB of knowledge in twenty-four hours of every day.
5) To method this immense quantity of knowledge, traditional digital computers face constraints like interval, recourses and value.
6) Supercomputing are often an answer however it's quite overpriced.
7) Cluster computing with the assistance of middleware are often low-priced and acceptable resolution.

B. Proposed System

The main focus of this project is to create a small and compact 4-node Bewolf cluster which will work on the same principle as the one on the server works and understands how it works.This project also provides any teacher, student or industry personnel who their own cluster and provides with the step to do so.This project aims to create a model of cluster computer more specifically a model of Bewolf cluster which are used for big data analysis as refered in.It will be using Raspberry Pi's to run and make the system. The cluster we will be creating will be a 5-node cluster. As the part of this project we will first start by installing Raspberry Pi and Bewolf cluster on single raspberry pi and checking its performance. Then we will start integrating one node (means a raspberry pi) at a time and perform various test to check the performance of the cluster. This will continue till all the four nodes (as we are creating a 5 node cluster) are attached to each other and a cluster is formed the performance of will be tested as a whole. Upon constructing the required cluster computer and installing the required softwares the processing and implementation of data will be divided into 3 parts. The input data or file will be provided to the master Rpi .The master pi will distribute the file to other slave nodes .The slave node along with master will process the input file using putty software installed and give the result to user.The input for the system will be the input file on which the processing is needed to be done. For the output, the data will be analyzed and return in structured format according to the need required and useless data is segregate.

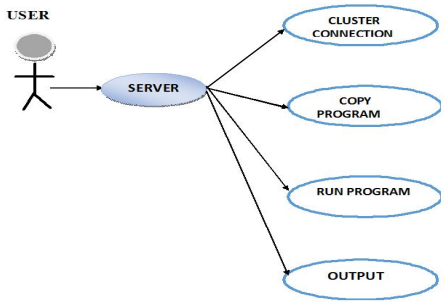
III. ARCHITECTURE OF PROPOSED SYSTEM



©IJRASET: All Rights are Reserved

IV. ACTVITY AND USE CASE DIAGRAMS

A. Use Case Diagram



B. System Configuration

1) Hardware Requirements

a) Raspberry pi 3B
b) Network Switch

2) Software Requirements

a) Linux Scratch OS
b) Putty
c) Python

C. Output and Results

	Single processor	Cluster
Execution time	0.40297102 92816162 ms	0.20827 1066113 2812 ms

V. CONCLUSION & FUTURE SCOPE

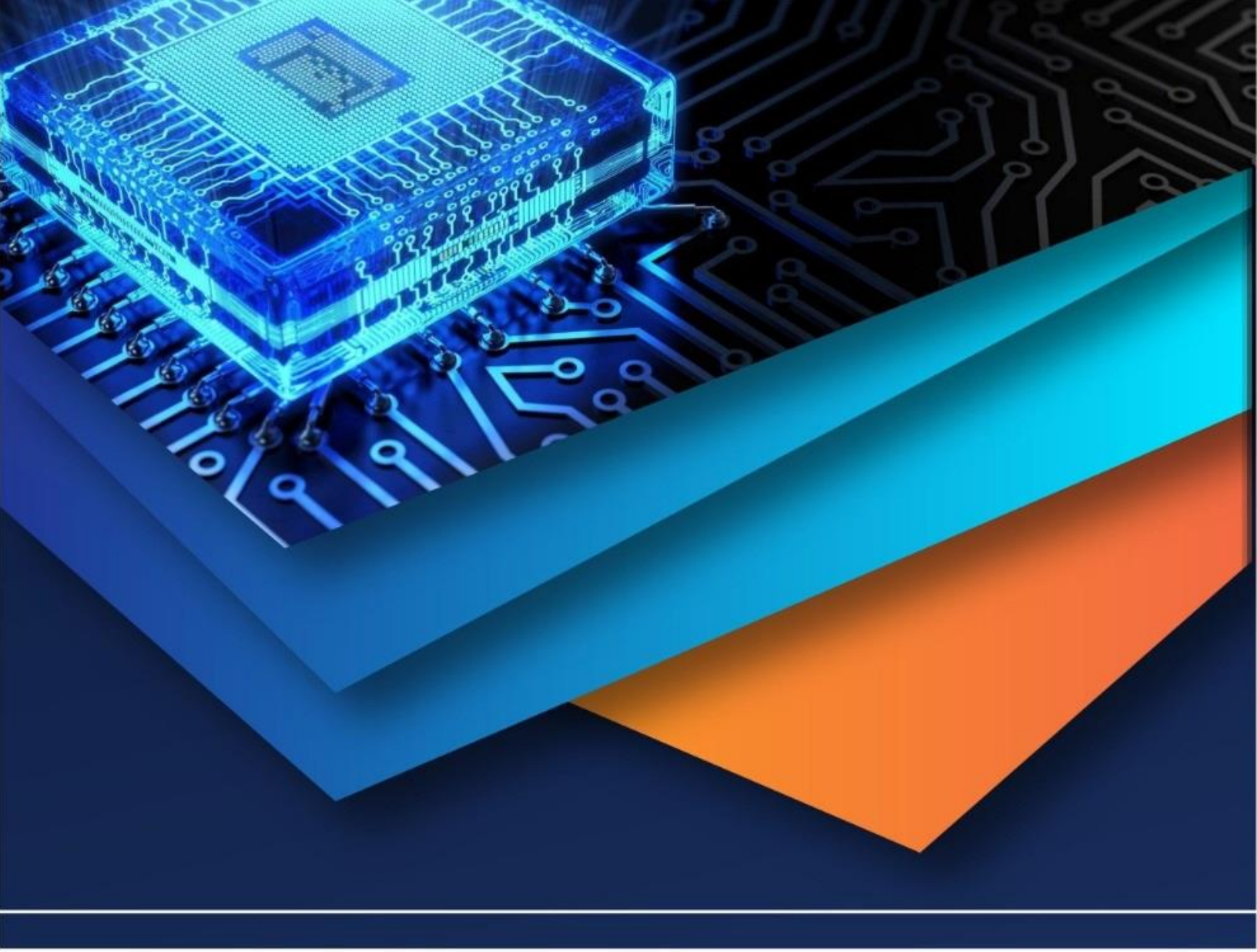
With the advent of cluster computing technology and the availability of low cost cluster solutions, more research computing applications are being deployed in a cluster environment rather than on a single shared-memory system. High-performance cluster computing is more than just having a large number of computers connected with high-bandwidth low-latency interconnects. To achieve the intended speed-up and performance, the application itself has to be well parallelized for the distributed-memory environment.

Future Scope Cluster systems derive their computational power by exploiting parallelism. Programs for cluster systems must be splitted up into many smaller sub-programs which can be executed in parallel on different processors. cluster systems can offer parallelism at a much larger scale, with 100's or 1000's, or even millions of tasks running concurrently. However, writing parallel software can be challenging, and many existing software packages do not already support parallelism & may require development.

REFERENCES

[1] CRM in the automotive and tourist area (IEEE-DEST 2001) (SICE Annual Conference2011Sept. 17-20, 2011, Kagawa University, Japan).
[2] Project Report - GPS Tracker Pascal Bragger Msc CourseUbiquitous Computing University of Fribourg, Switzerland March 9, 2006.
[3] Master Thesis Mathematical Modeling and Simulation Thesis no: 2008 – 6 May 2008.
[4] M. Azam, K. Pattipati, J. Allanach, S. Poll, and A. Patterson-Hine, "In-flight fault detection and isolation in aircraft flight control systems," presented at the IEEE Aerospace Conf., Big Sky, MT, March. 2005.
[5] Hertel, Sascha: Mobile Client fürzukünftige Mobile Anwendungen; Thesis SS 2006.
[6] Non –Intrusive GPS Tracking method (Gdanak University of Technology, Multimedia systems Department, Poland 2005.
[7] Differential GPS reference Station Algorithm- Design And Analysis by Jay Farrel and Tony Givargis, Vol. 8, NO.3, May 2000.

©IJRASET: All Rights are Reserved



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)