Bharath
INSTITUTE OF HIGHER EDUCATION AND RESEARCH
(Declared as Deemed-to-be University under section 3 of UGC Act, 1956)
(Vide Notification No. F.9-5/2000 - U.3, Ministry of Human Resource Development, Govt. of India, dated 4th July 2002)
Accredited by NAAC
NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL
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Ref No.SMS-2018-O-27 Date: 07/11/2019

TO

Mrs. V. Brindha,

Asst. Professor/ Computer Applications,

BIHER.

Thro: Concern Head of the Department

Greetings!!!

We are happy to announce that the Research Advisory Committee has approved your proposal for Seed Money Scheme-2018 which was presented by you. You are requested to complete the proposal and send the progress report to the Dean Research in the prescribed time period.

Title of the Project: Energy Efficient Strategy for Powerful Virtual Machine in Cloud Computing

Seed Money Amount: Rs.1, 00,000/- (Rupees One Lakh Only)

Approved on: 04/11/2019

Payment details:

Voucher No.27 **Dated: 08/11/2019**

With Regards

07/11/2019

Dean-Research

Bharath University

SELAIYUR, CHENNAI - 600 073, TAMIL NADU, INDIA.

CASH / PAYMENT VOUCHER

Date 08/11/19

V.No. 027

Debit _____ Amount

Rs. 1,00,000/-

PAID TO Mrs. V. Brindha

RUPEES One lakh only.

TOWARDS Seed money scheme - 2018.

Authorised by

BHARATH UNIVERSITY CHENNAI 600 073 INDIA

Finance Manager

Cashier/Accountant

V. Brindha

Payee's Signature

PROPOSAL SUBMISSION

1. **Details of Principal Investigator**

Name	: Ms. V. BRINDHA
Designation	: Assistant Professor
Highest Qualifications	: M. Phil
Department	: Computer Applications
E-mail	: brindharamesh21@gmail.com
Contact Number	: 9940697789
Date of Joining	: 12.07.2017

2. **Details of Co - Principal Investigator**

Name	: Dr. A. MUTHUKUMARAVEL
Designation	: Dean – Faculty of Arts and Science
Highest Qualifications	: Ph.D.
Department	: Computer Applications
E-mail	: muthu14673@gmail.com
Contact Number	: 9500137273
Date of Joining	: 12.07.2013

Technical details

1. Introduction

Powerful data centres are the important supporting foundation for mobile, ubiquitous, and analytic computing, which are the most popular computing model to utilize all kinds of physical resources and provide various services. We investigate the issue of increasing the resource utilization of data centres to improve their production and lower the cost. I technically, server virtualization provides the chance to share resources in data centres. However, it also introduces another problem, the main problem being virtual machine placement (VMP), which is to choose a proper concrete machine (PM) to use virtual machines (VMs) in runtime.

We study the virtual machine placement problem with the pick out of minimizing the total energy consumption by the running of PMs, which is also an indication of resource utilization and the cost of a data centre. Due to the multiple depth of physical resources, there always exists a waste of resources, which results from the disparity use of multi-dimensional resources. To characterize the multi-dimensional method consume states of PMs, we present a multi-dimensional space partition model. Foremost in this model we put forward a virtual machine placement algorithm EAGLE, which can stable the usage of multi-dimensional resources, decrease the number of running PMs, and thus reduce the energy consumption.

2. Review of status of Research and Development in the subject

One key technology used to enlarge resource utilization is server virtualization. Virtual machines (VMs), each of which acts like an actual computer with an operating system, are generated on underlying physical machines (PMs). With such virtualization, this method can be organized with fine-granularity, which refine resource utilization notably. At the same time, nevertheless VMs share physical resources, with each VM runs individually with a proprietary resource; this makes it practicable to guarantee the quality of provided service. Server virtualization is an important way to grow resource utilization and upgrade quality of service.

The basic key circulation arrangement in server virtualization is virtual machine placement (VMP), which is to select some acceptable PM to locate duration each newly-created VM in

runtime. VMP is a foremost problem, while it is a highly complex task caused by various constraints, including performance, scalability, availability, network, cost, etc.

One essential concern during the virtual machine arrangement process is reducing energy consumption caused by the running PMs. pull through works show the consequence of the virtual machine placement problem, and we can benefit from the appropriate placement policy on energy saving.

Cutting down energy utilization has significant impacts on (i) reducing the energy cost, which composes a significant portion of the total maintenance cost of data centres, and keeps on increasing since the unit price of energy rises over time, and (ii) making the data centre more 'green', and sustainable, concerning energy.

One efficient way to cut down the energy consumption is to bring to the number of running PMs. As dissimilar VMs require different kinds and amounts of resources (e.g., CPU, memory, disk, bandwidth, etc.), when placing VMs on PMs to meet such requirements, a PM cannot host any more VM as long as an random dimensional resource is exhausted, even when all other dimensional resources are sufficient; this is a phenomenon well-known as bucket effects. We have to low the number of resource fragments and reduce their sizes, as well. Since the resource particle create from the imbalanced use of resources will be a over unlike dimensions, the placement of VMs on PMs should be controlled in a resource- stabled manner. To achieve this, in this paper a multi- dimensional space separated model is characterized in the resource utilize of each PM. In this model, each dimension of the area corresponds to a one-dimensional measure, and the whole space is separate into three domains with typical features, which show the fit of resource utilization for each placement task.

The multi-dimensional space partition model, we further propose EAGLE, an energy efficient online VM placement algorithm with balanced resource consumption. When a new VM placement task arrives, algorithm checks the posterior resource used state for each feasible PM then chooses the most suitable PM according to the proposed model. Contrast to traditional greedy algorithms such as the first fit algorithm, which places the VM on any random feasible PM, our algorithm can consume the resource in a more stabled manner, thus introducing fewer and portable resource fragments, and farther consuming slighter energy.

Our main contributions are two-fold:

To initiate a multi-dimensional space partition model, this can be used to attendant the design of the resource-balanced VM placement algorithm

The concept of resource outgoing is defined and it has no analysis method to characterize the eligibility of resource utilization. In this paper, we present a model to represent the purpose of multi-dimensional resources and a balanced algorithm to improve resource utilization. Also, more enough experiments are brought out, and the model and algorithm are checked clearly. This paper has more new investigations than were provided.

O1 (the red point) is the center of the red quarter circle and O2 (the Green point) is the center of the green quarter circle. The safety domain lies in the space between the three quarter circles and square edges. The acceptance domain has a higher priority if there exists an overlapped zone.

Generally, for the D-dimensional space partition model, given point S (γ_1, γ_2. . . γ_D) and the parameters r_0 and R_0, the

2.1 International Status: NIL

2.2 National Status: NIL

3. **Progress/achievement so far,**

a) Reference papers were collected.
b) Literature survey was studied.
c) Proposal work has been started.

4. **Work Plan:**

4.1 Methodology:

The main objectives of the Energy Efficient Strategy for Virtual Machine in Cloud are as follows,

Multi-dimensional space partition model

PM consists of D-dimensional resources; it will be fully charged if an arbitrary dimensional resource is received. Then a new PM starts up to host other VMs.

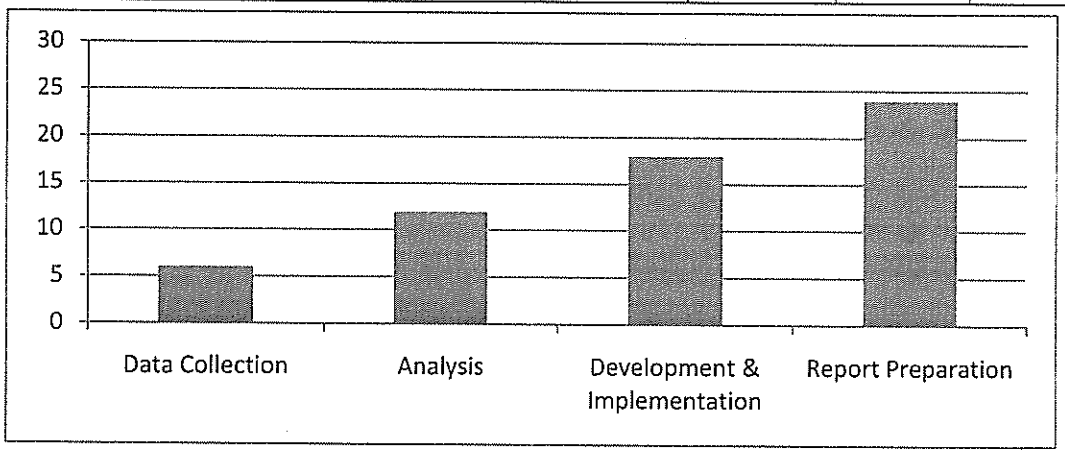
There may be resource particle in the fully loaded PM. In order to minimize the number of PMs under a given VM sequence, it is need to decrease the resource fragment.

To represent the D-dimensional resource utilization of PM, we propose a multi-dimensional space separating model, which can also judge the fitness of resource usage for the VM placement, and thereby guide VM placement. The primary idea of a multi-dimensional space separation model is that it features a resource leak quantitatively. At first, we define the usage state of PM.

4.2 Time Schedule of activities giving milestones through BAR diagram.

Work plan (including detailed methodology and time schedule)

Sl. No.	Activity / Milestone	1st Year		2nd Year	
1.	Data Collection	1-6			
2.	Analysis		7-12		
3.	Development & Implementation			13-18	
4.	Report Preparation				19-24



4.3.Expected outcome within the time period of Seed Money Scheme

a) The trouble of online virtual machine placement with the goal of decreasing the total energy usage.

b) The successes and planning of EAGLE are validated via extensive experiments.

5. Suggested Plan of action stating the name of funding agency where the project will be communicated for financial support within the time period of project.

Nil

6. **Bibliography:** Nil

7. List of Projects submitted/implemented by the Investigators (Separate for Pi and Co-PI)

Nil

7.1 Details of Projects submitted to various funding agencies:

Sl. No.	Title	Cost in lakhs	Month of submission	Role as PI/ Co-PI	Agency	Status
1	NA	NA	NA	NA	NA	NA

7.2 Details of Projects under implementation

Sl. No.	Title	Cost in lakhs	Duration	Role as PI/ Co-PI	Agency
1	NA	NA	NA	NA	NA

7.3 Details of Projects completed during the last 5 years

Sl. No.	Title	Cost in lakhs	Duration	Role as PI/ Co-PI	Agency
1	NA	NA	NA	NA	NA

8. **List of publications published by the Investigators, if any:**

a) **Co - Principal Investigator**

S.No	Author names	Title of paper	Name of Journal	Vol (issue)	Page no.	Year
1.	Dr.A.Muthukumaravel, Dr.S.Purushothaman, R.Rajeswari	Development of Functional Back Propagation Neural Network for Concurrency Control in Computer Aided Design Database	International Journal of Latest Trends in Engineering and Technology	Vol. 2 Issue 2	133	2013
2.	Dr. A.Muthukumaravel, Dr. S. Prasanna , S. Deepa	Supporting Various Techniques to optimize and secure application performance in a Cloud Computing Security in a effective manner	International Journal of Emerging Technology and Advanced Engineering	Volume 3, Issue 4	778	2013
3.	A.Muthukumaravel, Dr.S.Purushothaman, Dr.A.Jothi	Implementation of Locally Weighted Projection Regression Network for Concurrency Control In Computer Aided Design	International Journal of Advanced Computer Science and Applications	Vol. 2, No. 8,	46	2011
4.	MS.P.JENNIFER , Dr. A.Muthu Kumaravel	Comparative Analysis of advanced Face Recognition Techniques	International Journal of Innovative Research in Computer and Communication Engineering	Vol. 2, Issue 7,	4917	July 2014
5.	Dr.A.Muthu Kumaravel	Emotion Recognition Using Human Computation Technique	International Journal of Innovative Research in Computer and Communication Engineering	Vol. 2, Issue 7	4939	July 201
6.	Dr. A. MuthuKumaravel	Analyzing Complexities in Developing Software	International Journal of Innovative Research in Computer and Communication Engineering	Vol. 2, Issue 2	2883	Febr ary 201
7.	D. Divya , Dr. A.Muthukumaravel, Dr. P. Mayilvahanan	XML with Cluster Feature Extraction For Efficient Search	International Journal of Emerging Technology and Advanced Engineering	Volume 3, Issue 8	292	Aug st 201

8.	Dr. A.Muthu Kumaravel A.Jerome Robinson. K.Satyanarayana	Implementation of Cloud Computing In the Department of Archaeology	International Journal of Innovative Research in Computer and Communication Engineering		2320-9798	2015
9.	Dr. A.Muthu Kumaravel. P.Jennifer Kannan subramanian	Time Division Multiplexing Access Networks with Duplex Channels	International Journal of Innovative Research in Computer and Communication Engineering		2320-9798	2015
10	Dr. A.Muthukumaravel	Security Analysis of Single Sign on Mechanism for Distributed Computer Network	International Journal of Innovative Research in Computer and Communication Engineering			2015

b) Principal Investigator

S.No	Author names	Title of paper	Name of Journal	Vol (issue)	Page no.	Year
1.	K. Hema, V. Brindha	FUZZY BASED SMART GREENHOUSE HYDROPONIC CONTROL SYSTME USING IOT AND CLOUD TECHNOLOGY	JOURNAL OF ADVANCE RESEARCH IN DYNAMICAL AND CONTROL SYSTEMS	VOL-10 , 03 - Special Issue		2018
2.	M.Divya, V. Brindha	MERGE OF BROAD NETWORKS FOR STURDY LANDMARK RETRIEVAL USING AN EFFECTIVE MULTI-QUERY EXPANSION	INTERNATIONAL JOURNAL OF PURE AND APPLIED MATHEMATICS	VOL-118, 20 Special Issue		2018
3.	Dr. A Muthukumaravel, R.Frizilin, V. Brindha	COMPARATIVE ANALYSIS OF LIVER SEGMENTATION USING K-MEANS, FUZZY c-MEANS AND SPATIAL FCM USING MUMFORD SHAH APPROACH	JOURNAL OF ADVANCE RESEARCH IN DYNAMICAL AND CONTROL SYSTEMS	VOL-11, 02 - Special Issue		2019

CERTIFICATE FROM THE INVESTIGATOR

Project Title: ENERGY EFFICIENT STRATERGY FOR POWERFUL VIRTUAL MACHINE IN CLOUD COMPUTING

It is certified that

1. I do hereby agree to submit a complete proposal for financial support to the external funding agency within the time period of SMS-2018
2. I undertake that spare time on equipment procured in the project will be made available to other users.
3. I agree to submit a certificate from Institutional Bio safety Committee, if the project involves the utilization of genetically engineered organisms. I also declare that while conducting experiments, the Bio safety Guidelines of Department of Biotechnology, Department of Health Research, GOI would be followed in to.
4. I agree to submit ethical clearance certificate from the concerned ethical committee, if the project involves field trails/experiments/exchange of specimens, human & animal materials etc.
5. I agree to abide by the terms and conditions of SMS-2018, BIHER, and Chennai.

V. Bindle

Name and signature of
Principal Investigator

Name and signature of
Co-Principal Investigator

Dean Faculty of Arts & Science
Bharath Institute of Higher Education & Research
(Declared as Deemed to be University U/S 3 of UGC Act. 1956)
Chennai-600 073. INDIA

Date: 05.10.2019

Place: Chennai – 73

Forwarded by Head of the Department

Dr.D.KERANA HANIREX
Associate Professor & Head
Dept. of Computer Applications
Faculty of Arts and Science
BIHER, Chennai-600 126

Signature of the Head

PROJECT EVALUATION FORMAT

Recommendation Sheet

Name of the Principal Investigator	Ms. V. BRINDHA
Name of the Co-Investigator	Dr. A. MUTHUKUMARAVEL
Name of the Department	Computer Applications
Title of project	ENERGY EFFICIENT STRATERGY FOR POWERFUL VIRTUAL MACHINE IN CLOUD COMPUTING
Recommendation of the evaluation committee	Yes.
Financial allocation recommended	Rs. 1,00,000/-

S.No	Activities	Amount in INR Rs.
1.	Supporting Technical staff	30,000
2.	Permanent equipments (only project specific, minor equipments: major equipments /facilities are expected to be already available with the institution(s): Name & cost may be indicated)	35,000
3.	Consumables (CD, Hard Disk for data Storage) Other Consumable, cartridge, paper roll	15,000
4.	Travel	20,000
5.	Total Cost of Project in Rupees	1,00,000

Name and Signature of the Research Advisory Committee members with date

Recommended

Internal Quality Assurance Cell IQAC Sathyabama Chennai-119 BIHER

Dr. P. Naveenchandran