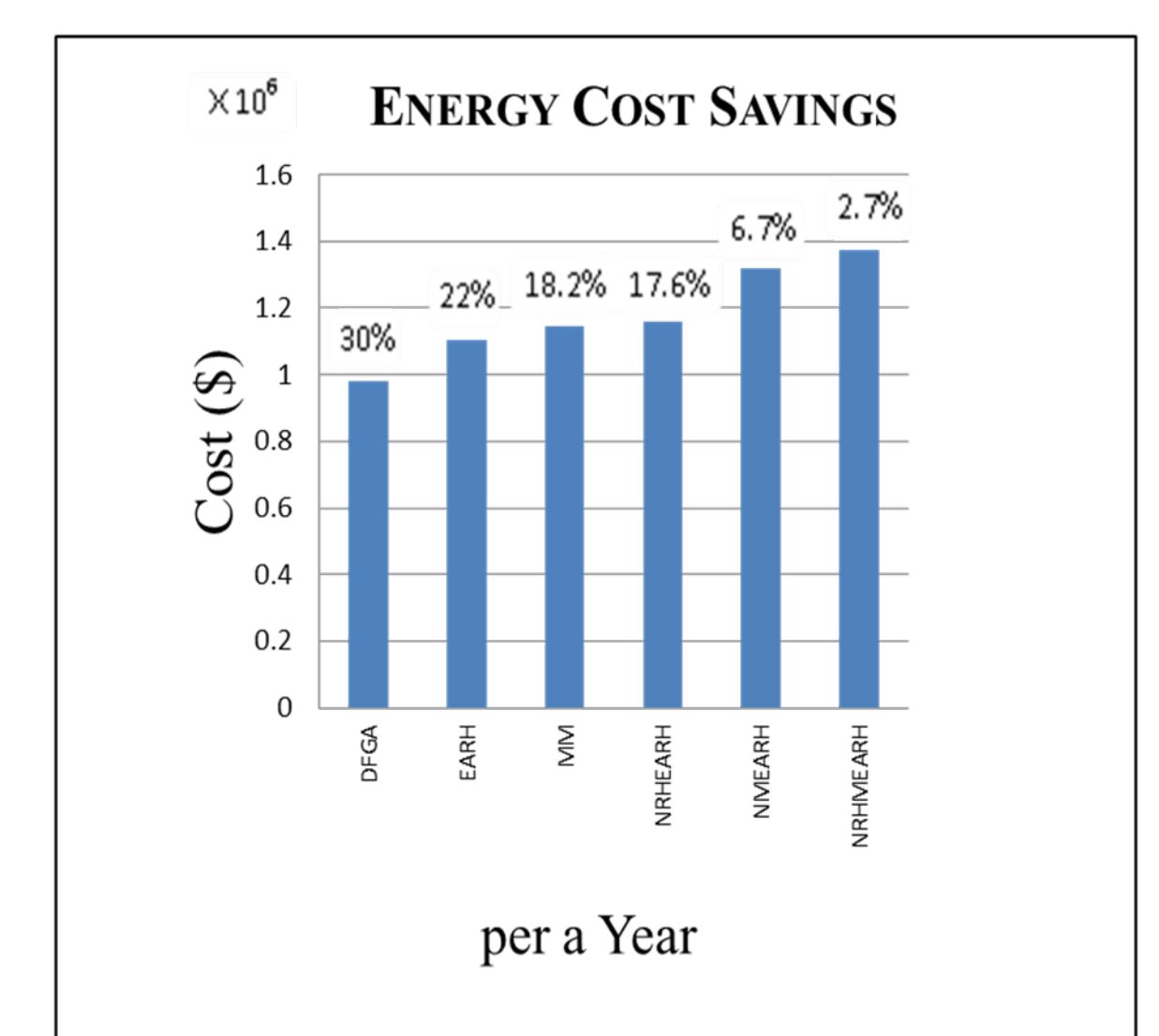
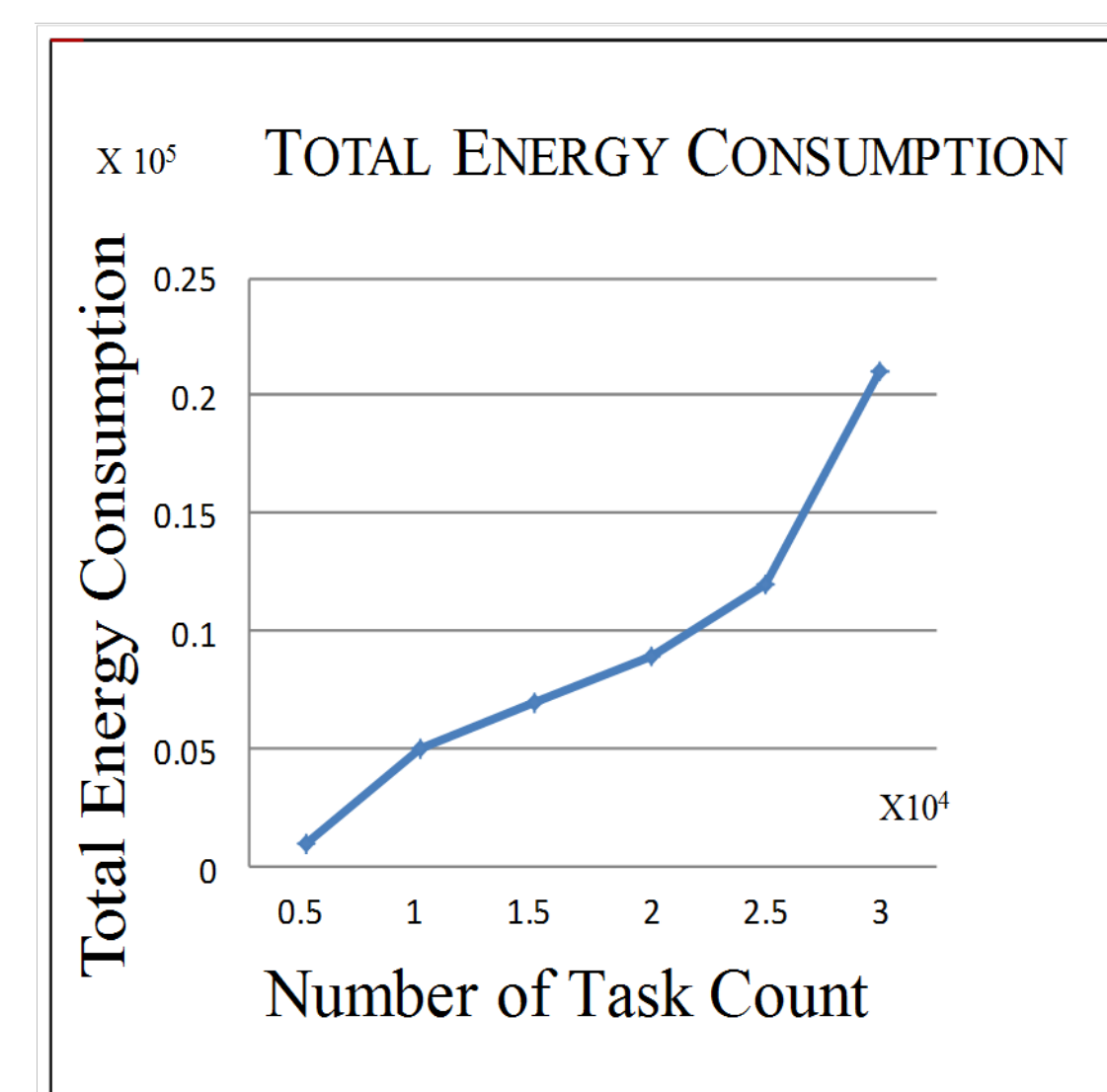
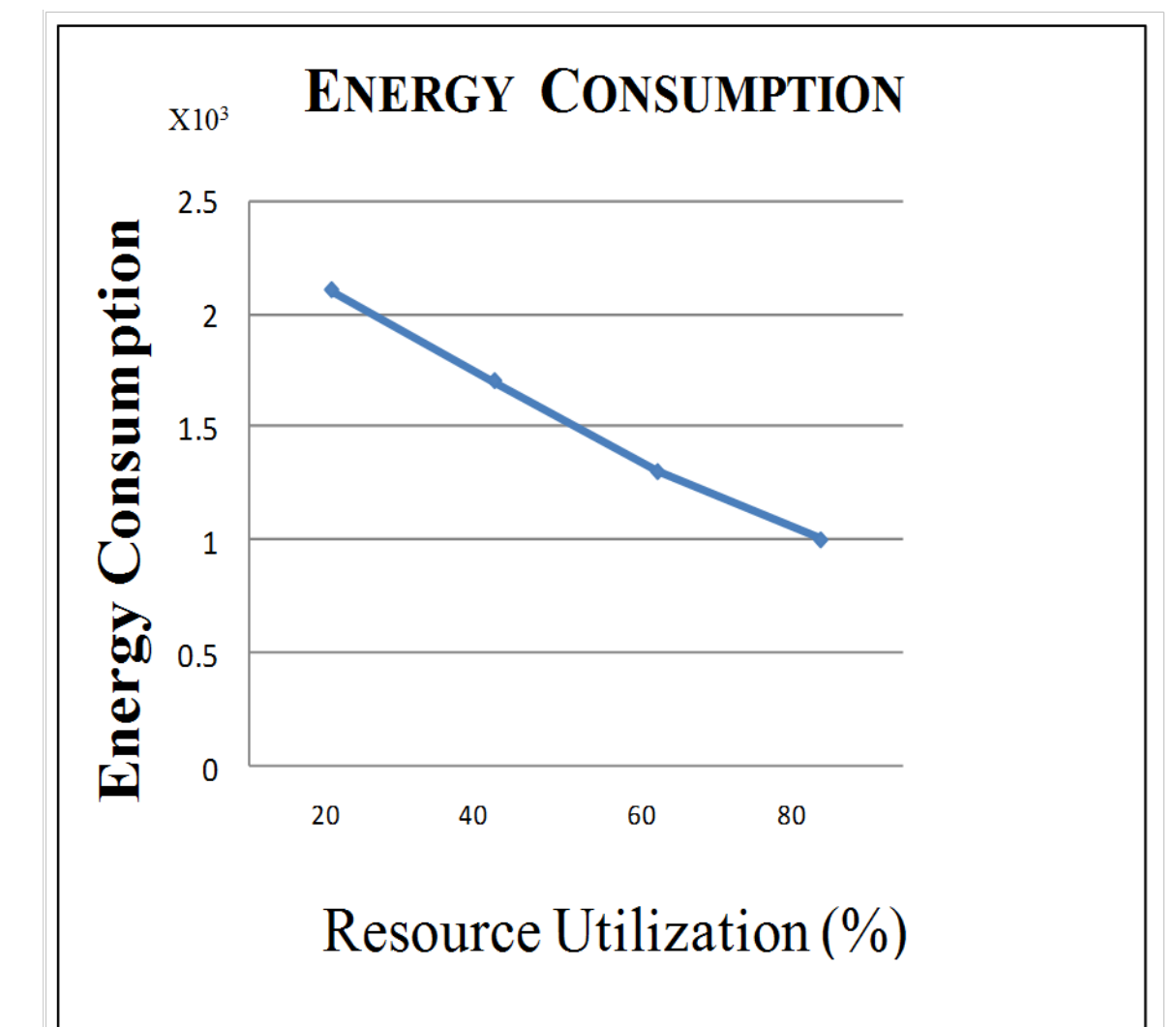
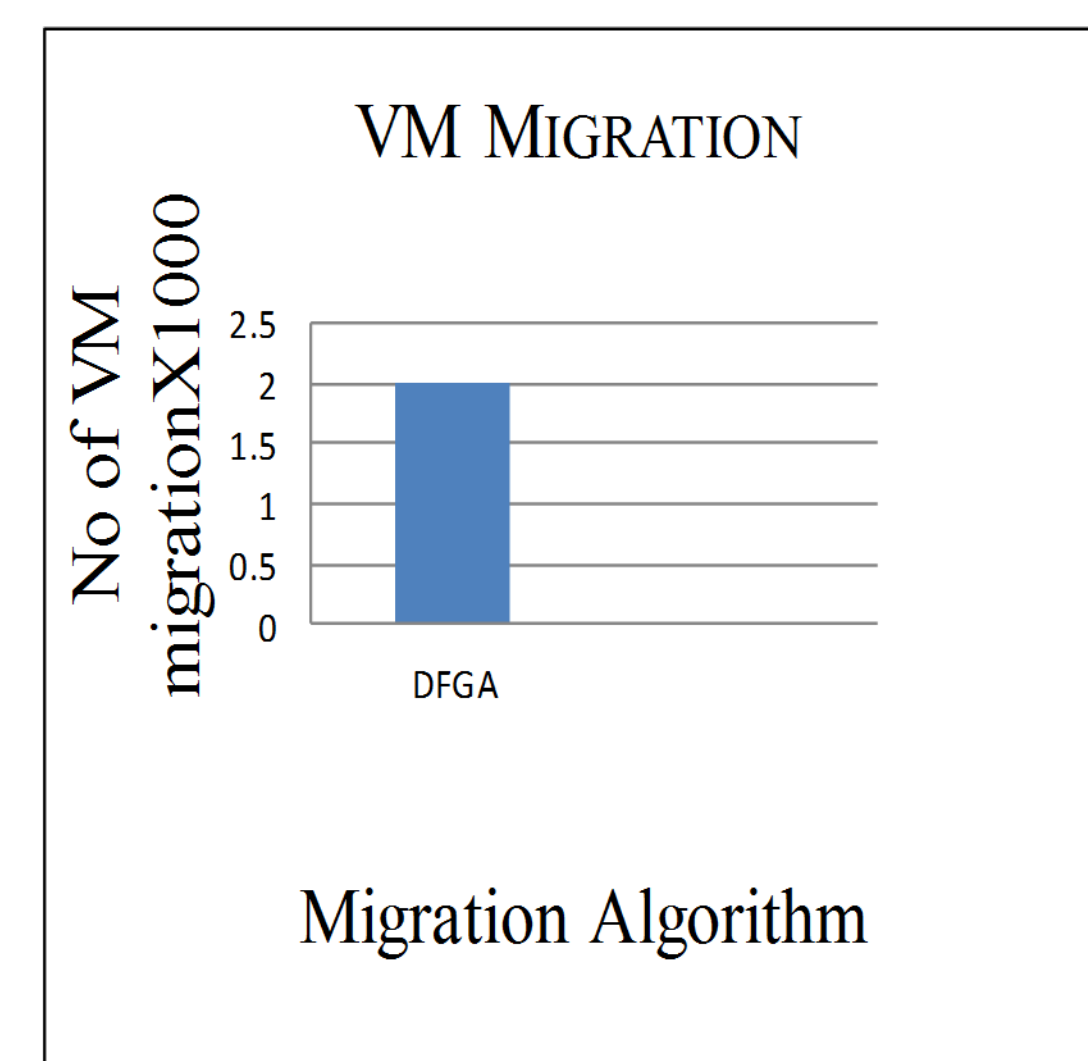
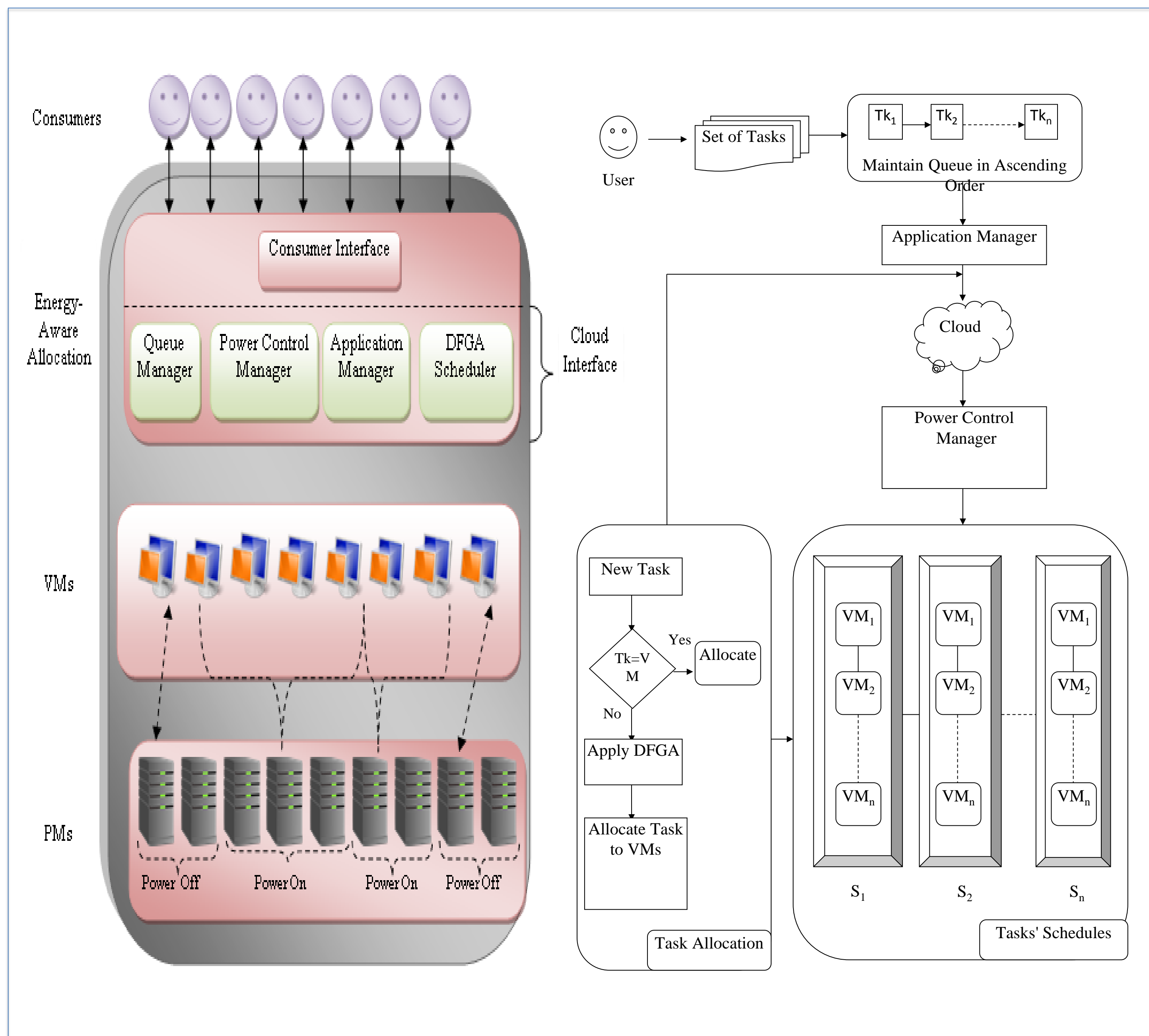


ENEFDA- Improving Energy Consumption in Cloud Computing Datacenter



NEED

According to the 2016 EPA's report on datacenter energy, 40% of all datacenter power consumption and 80% of the total IT load power consumption are consumed by servers, and these percentages are increasing with the popularity increase of cloud computing technology utilized by big companies such as eBay, Facebook, Yahoo, and Google. Besides consuming massive amounts of energy, a huge amount of CO2 emission can be produced. As a result, these companies have been looking for solutions to reduce the energy consumption without affecting on the quality of the cloud services they are offered to their customers.

APPROACH

A novel DNA based Fuzzy Genetic scheduling algorithm (DFGA) for cloud computing datacenters to maximize the resource utilization ratio and hence, reduce the energy consumption (refer to image).

BENEFIT

Enhancing Cloud computing datacenters energy-aware efficiency based approaches (refer to table)

- Maximize the resource utilization ratio.
- Minimize the number of VM migration.
- Reduce the energy consumption.

Metric	ΔP_{total}	EC/RU	RU (%)	VMM(X1000)	\$1.4 m \text{ \textbackslash} year \$0.10 kWh 12.583 server
Algorithm					
DFGA (Proposed Method)	2.15	3.12	82%	2	30% \approx \$400000
EARH	2.55	4.95	72.8%	3.2	22% \approx \$298400
NRHEARH	2.68	6.83	65.6%	4.8	17.6% \approx \$242240
NMEARH	3.28	8.28	43.5%	-	6.7% \approx \$83040
NRHMEARH	3.87	10.21	39.8%	-	2.7% \approx \$28160
MBFD & MM	2.65	5.98	70%	5	18.2% \approx \$255200

MARKET POTENTIAL

- Big Data and IoT Industries
- Smart Cities
- Cloud, Grid, Distributed Computing Companies and Organizations such as Google, Yahoo, Amazon, and e-pay.



Project Leader : Assoc. Prof. Dr. Syed Abdul Rahman Al-Haddad Syed Mohamed

Co-Researchers : Sura Khalil Abd; Dr. Fazirulhisyam Hashim; Dr. Azizol Abdullah; Assoc. Prof. Dr. Salman Yussof; Dr. Mustafa Musa

Faculty : Engineering

Email : sar@upm.my

Phone : +603-8946 6440

Expertise : Cloud computing, Networking, Human Sound Processing, Animal Sound Processing, Quran sound processing