

TABLE OF CONTENT

CHAPTER NO	TITLE	PAGE NO
	LIST OF TABLES	ix
	LIST OF FIGURES	x
	LIST OF ABBREVIATIONS	xii
	ABSTRACT	xiv
1	INTRODUCTION	
1.1.	Background	1
1.2.	Resource Allocation in Cloud Environment	3
1.2.1.	Dynamic Resource Allocation in Cloud Infrastructure	4
1.2.2.	Congestion Control Method in Resource Allocation at Cloud	8
1.2.2.1.	Cloud Resource Allocation Model	9
1.3.	Energy Consumption in Cloud Environment	11
1.3.1.	Secure Collaborative Integrity Verification	14
1.4.	Multi-Tasking in Cloud Platform	17
1.4.1.	Multi-objective QoS Optimization Based on Multiple Workflow Scheduling	18
1.5.	Challenges and Opportunities	21
1.5.1.	Opportunities	22
1.5.2.	Challenges	24
1.6.	Purpose of the Study	26
1.7.	Organization of the Thesis	27
2	LITERATURE REVIEW	
2.1.	Introduction	29
2.2.	Different Resource Allocation Technique in Cloud Computing Environment	31
2.2.1.	Energy-efficient Resource Allocation in Cloud Computing	31
2.2.2.	Efficient Resource Management and Scheduling in Cloud Environment	36
2.2.3.	Resource Management with Improving Scheduling Effects	40
2.3.	Load Balancing Approach in Cloud Environment	44

2.3.1. Different Load Balancing Techniques in Cloud Infrastructure	45
2.3.2. Certain Load Balancing Technique with Minimal Bandwidth Usage	49
2.3.3. Organizing Resource with Load Balancing Factor	54
2.4. Different Techniques in Multi-Task Handling	61
2.4.1. Clustering Related Multi-tasking in Cloud Environment	62
2.4.2. Resource Allocation and Job Execution in Cloud Environment	65
2.4.3. Different Job Scheduling Algorithm in Cloud Computing Platforms	68
2.5. Research Gap	73
2.6. Contribution of Thesis	76
3 EFFICIENT RESOURCE ALLOCATION IN CLOUD ENVIRONMENT WITH DEVELOPMENT OF INTERFERENCE AWARE TECHNIQUE	
3.1. Introduction	77
3.2. Resource Allocation in Cloud Computing	78
3.2.1. Power of Virtualization Technique in Cloud Environment	80
3.3. Development of Interference Aware Resource Allocation Technique	83
3.3.1. Infrastructural System Arrangement Facilitates	85
3.3.2. System Setup of IARA Technique	86
3.3.3. Interference Parameter	90
3.3.4. Power Utilization in IARA Technique	92
3.3.5. IARA Algorithm	93
3.3.6. Resource Allocation: Case Study	94
3.4. Experimental Evaluation	95
3.5. Result Analysis	97
3.5.1. Measure of Resource Allocation Efficiency	97
3.5.2. Measure of Evaluation Time in Allocating Resource	99
3.5.3. Measure of Energy Utilization Rate	101
3.6. Summary	103
4 ADAPTIVE LOAD BALANCING APPROACH IN CLOUD INFRASTRUCTURE FOR ENERGY CONSUMPTION	
4.1. Introduction	105
4.2. Cloud Computing for Efficient Bandwidth Utilization and Energy Consumption	107
4.2.1. Load Balancing with Energy Consumption in Cloud	107
4.3. Cloud Infrastructure with Adaptive Load Balancing Approach	110

4.3.1. Design Phase of Adaptive Load Balancing	113
4.3.2. Clustering Method in Load Balancing	115
4.3.3. ALB Approach in Trigger of Server Congestion	120
4.4. Experimental Evaluation	120
4.5. Result Analysis	122
4.5.1. Measure of Energy Consumption	122
4.5.2. Measure of Bandwidth Utilization	124
4.5.3. Performance Trade off	126
4.5.4. Measure of Response Time	128
4.6. Summary	130
5 WORKLOAD MULTI-TASK SCHEDULER WITH GENETIC CLUSTERING IN CLOUD ENVIRONMENT	
5.1. Introduction	131
5.2. Multi-Tasking in Cloud Environment	132
5.2.1. Scheduling of Multitasking Workload	134
5.3. Genetic Clustering Methodology with Workload Multi-Task Scheduler	137
5.3.1. Workload Partition in Cloud Services Using Genetic Clustering Process	140
5.3.2. Multi-task Scheduler in Workload Balancing	143
5.3.3. Algorithmic Steps in GCWM Scheduler	145
5.4. Experimental Evaluation	147
5.5. Result Analysis	148
5.5.1. Throughput	148
5.5.2. Measure of Workload Management Efficiency	150
5.5.3. Average Relative Cost	152
5.6. Summary	154
6 PERFORMANCE ANALYSIS OF MULTI-TASKING BASED LOAD BALANCING DURING RESOURCE ALLOCATION IN CLOUD	
6.1. Introduction	156
6.2. Analysis of Interference Aware Resource Allocation Technique in Cloud Environment	157
6.2.1. Quantitative Analysis for Interoperability	159
6.2.2. Measure of Scalability	162
6.2.3. Quantitative Analysis on Computational Cost	164
6.3. Analysis of Adaptive Load Balancing Approach in Cloud Infrastructure for Energy Consumption	166

6.3.1. Measure of Load Balance Factor	168
6.3.2. Quantitative Analysis of Clustering Efficiency	170
6.3.3. Measure of Computational Cost	172
6.4. Analysis of Genetic Clustering Methodology with Workload Multi-Task Scheduler	174
6.4.1. Generic Based Cloud Services	176
6.4.2. Measure of Multi-Task Clustering Effect	178
6.4.3. Measure of Computational Cost	180
6.4.4. Measure of Computational Complexity	182
6.5. Summary	184
7 CONCLUSION AND FUTURE RESEARCH DIRECTIONS	
7.1. Conclusion	186
7.2. Future Research Directions	188
Reference	189
Publications	200