



# Hawk-i HPC CLOUD Benchmark Tool

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## **Abstract**

This is the bit where you summarise what is in your thesis.

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## **Acknowledgements**

# **Chapter 1**

## **Introduction**

Stating the problem and

# **Chapter 2**

## **Background**

### **2.1 Cloud Computing**

#### **2.1.1 Why Cloud Computing?**

**Resource on-demand**

easy, accesibility



**Pay as you go**

**Maintenance and Upgradation**

**Eco-friendly**

## **2.1.2 Cloud Computing service models**

**IaaS**

**PaaS**

**SaaS**

## **2.1.3 Cloud Computing Deployment models**

**Private Cloud**

**Public Cloud**

**Hybrid Cloud**

**Community Cloud**

## **2.2 Amazon Web Service**

### **2.2.1 Amazon Machine Instance**

#### **2.2.2 Types of Instances**

#### **2.2.3 EC2**

different instances chart and limitations of microinstance.

**EC2 cluster compute**

## **2.3 HPC in the cloud**

Introduction Paragraph, comparison with Clusters

### **2.3.1 Advantages**

### **2.3.2 Limitation**

Network Limitations, Availability, Stability of performance Benefits

### **2.3.3 Amazon Cluster compute**

## **2.4 Parallel Applications and 13 Dwarfs**

Explain the 13 dwarfs and under the two sections explain N-body and FFT

### **2.4.1 N-Body Methods**

MD, About the dwarf and application types optimisation,  $n^2$  and  $n \log n$  Communication pattern!!!

### **2.4.2 Spectral Methods**

FFT, About the dwarf and application types Communication pattern!!!

# **Chapter 3**

## **Live Benchmark Tool Setup**

### **3.1 System Design**

#### **3.1.1 Architecture**

#### **3.1.2 Sequence diagram**

#### **3.1.3 Database Design**

### **3.2 Instance types Used**

Refer to graph in Background Why these types?

### **3.3 Sun Grid Engine Cluster**

Why sungrid Engine

### **3.4 SGE Clustering in Amazon cloud**

benchmark to show how cluster instances are faster than normal high cpu instances

### **3.5 Web interface**

Describe in detail

### **3.5.1 Admin panel**

### **3.5.2 User Dashboard**

# **Chapter 4**

## **Results and Analysis**

### **4.1 Serial**

for each instance type time to result, execution time, increasing problem size N-body and FFT

### **4.2 Parallel program**

execution time, increasing problem size, number of cores N-body and FFT

### **4.3 Stability of results**

History of execution, snapshot from dashboard

## **Chapter 5**

## **Conclusions**

# **Appendix A**

## **Cluster Computing Setup**

**A.0.1 Using Starcluster**

**A.0.2 Cluster Management package**

**A.0.3 Using Sun Grid Engine**

**A.0.4 Creating Dashboard**

## **Appendix B**

### **Benchmarking programs**



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