

**PART I**  
**PRELIMINARY**

**1.1 Background**

At present, the activity of overclock on computers is increasing, from the use of daily overclock up to use such extreme overclock when its competition held overclock. If the process is done properly then overclock the performance obtained will be much better because of some of the hardware contained in computer was created to be able to exceed the limits of its default, but if it fails then it will reflect badly on any computer device. To perform the necessary knowledge and experience overclocking is good for overclockers (overclock actors) as well as the knowledge of the computer device by selecting the device that is already designed or known able to go beyond their normal specifications.

overclocking often associated with something negative, because of the negative effects that can be caused, especially if the procedure is less good overclocking, despite the fact that overclocking can provide more value or benefit. Although not all users require overclocking to achieve high performance, but the method is similar to overclocking even been done by the hardware vendors to squeeze their hardware performance to provide maximum performance [1].

To get the maximum overclock necessary supporting hardware such as motherboards with support for overclocking, power supply has a certificate of pure power, and the main CPU Cooler that can keep it in a cold state [2].

overclock intended for people who have a computer hardware with support for overclocking and want the speed of data processing which is more than the

hardware that is owned by the current, and overclock quite often made into a competition arena yearly to prove hardware fastest organized by the hardware manufacturer, More and more people are interested in overclocking just for a hobby, the need for higher performance, or to make overclocking as part of the e-sports [3].

Influence of hardware support when they wanted to do overclocking such a great Cooler has a major role in the stability of a system that has been overclocked, rising temperatures obtained from the overclock can make the system unstable and result in blue screens or instability in the system. Nice Cooler is not enough if it is not accompanied by a corresponding thermal paste so that the cooling process goes well [4].

Thermal paste is a paste that is used to conduct heat away from the CPU to the cooler. Because the surface of the CPU and Cooler uneven so it took a connection so that heat can be transferred to the maximum. Many people still do not understand how important it is in the process of thermal paste overclocking [4].

To find out the result of the different types of thermal paste is needed when they wanted to do Overclocking will be conducted experiments using an Intel CPU and Cooling manifold water cooling that where the system uses water for cooling, and therefore conducted this research with the title "ANALYSIS OF EFFECT OF THERMAL PASTE WHEN OVERCLOCKING" for see the influence of the type of thermal paste on the CPU performance.

## 1.2 Formulation of the problem

Based on the background as described above, it can be the formulation of the problem, namely,

1. How big is the influence of the type of thermal paste to the temperature and the level of system stability in overclocking?
2. How is the role of the overclocked processor temperature affect system performance?

## 1.3 Scope of problem

Based on the formula above, so as not to widen its topics to be discussed there should be a barrier to the problem, here's the problem boundary:

- a) overclocking CPU overclock using the menu available on the system UEFI motherboard Gigabyte Z270 Gaming 7.
- b) CPU using Intel Core i5 7600K.
- c) Cooler Deepcool cooling using 240EX.
- d) Overclocking only done on the CPU is not the graphics video card, ram, etc.
- e) Overclocking method is done using the tools available in the BIOS / UEFI motherboard, by increasing the speed to 4.2GHz, 4.4GHz, and 4.6GHz in accordance with the options available on the Gigabyte motherboard series Z270X Gaming 7 from the initial speed of Intel Core i5 7600K is 3.80GHz

- f) Thermal paste used here is Arctic Silver 5 for metal based, Noctua NT-H1 to ceramic-based, thermal paste that already exist when buying Deepcool 240EX for silicon based.
- g) Viewing the temperature difference between the types of types of thermal paste when overclocked progress.
- h) Stability measurement system using an application called Prime95 stress CPU which is where she will perform complex calculation will be done by the CPU during the time that we set.
- i) Analyzing the level of system stability when overclocking takes place each for 60min using CPU stress applications.
- j) CPU maximum temperature of 100 ° C is limited [19].
- k) Temperature measurement using sensors located on each component of the motherboard and read using 1.35 HWMonitor application.
- l) Measuring the success of overclock using scores generated application named Cinebench R15 CPU test.
- m) The operating system used is Windows 10 pro 64 bit.

#### **1.4 Purpose and Objective**

Purpose to be achieved from this research are:

- a) Provide information that can be used as one example of a reference in maximizing overclocking the processor in the future.
- b) Knowing the temperature difference can be from other types of thermal paste on the CPU during overclocking.
- c) Knowing the CPU speed increase after overclock.

The purpose of this study is approximately

- a) Analyze how much influence the type of thermal paste on the processor performance when overclocking is underway about the temperature that will be generated.
- b) Analyzing the most excellent thermal paste for use in overclocking three types tested to get maximum performance.
- c) As a graduation requirement SI at the University Amikom.

### **1.5 Research methods**

In doing research for this thesis is used the stage or the research process, which includes the following:

1. Problem Definition and Research Title
  - Formulating general and specific issues in a research environment.
  - Establish research titles.
2. Study of literature
  - Searches related theories.
  - Search journals according to the study.
3. Observation and Testing
  - Perform BIOS updates when available.
  - Increase the speed of the processor as recommended by the motherboard.
  - Testing the system stability using Prime95.

- Viewing the temperature obtained from the three types of thermal available.
- The test results on the CPU speed increase using Cinebench R15.

#### 4. Analysis and Conclusions

- Making the chart between each test.
- Analyze the results of each test overclocking then make a comparison between the three types of thermal tested.

#### 1.6 Writing system

Systematics of writing made to the preparation of the report can be structured and facilitate our understanding of the content of this thesis. The composition of the systematics of this paper is as follows:

#### **CHAPTER I INTRODUCTION**

The first chapter provides the background of the problem, formulation of the problem, problem definition, purpose and objective of the research, research methods, and systematic writing.

#### **CHAPTER II THEORETICAL BASIS**

The second chapter contains a literature review and description of the theory behind keeping Thesis writing, include ideas or techniques used, a description of the software and hardware used in this study.

#### **CHAPTER III RESEARCH METHODS**

In this third chapter contains the tools and materials, data analysis, research conducted groove.

#### **CHAPTER IV RESULTS AND DISCUSSION**

In this fourth chapter contains the results obtained after a series of experiments that exist as well as detailed discussion of research findings.

#### **CHAPTER V COVER**

In this chapter will be described on the conclusions and suggestions.

#### **BIBLIOGRAPHY**

