

Andrew Bartolo

*Variable Voltages: An Experiment on the Viability of Overclocking*

The intent of this experiment was to determine voltages necessary to be supplied to core computer components in order to attain stability at overclocked speeds. I hypothesized that CPU core voltage, vCore, would be most necessary to attain stability. Additionally, I hypothesized that slight overclocking would be acceptable for use in a non-error-tolerant (mission critical) environment. The hypothesis was tested on a self-built, high-performance desktop computer running the Linux operating system. Intel Linpack stress-testing software was installed, and stability trials were run at 2.6 GHz (factory default), 3.6 GHz, 3.8 GHz, 4.0 GHz, and 4.2 GHz. Voltages were raised sequentially, in their hypothesized order of importance, in order to attain stability at each speed. As speed was increased from the default 2.6 GHz up through 4.2 GHz, system components required more voltage, as was generally hypothesized. Increased vCore was most necessary in attaining stability, followed by increased vDIMM (RAM voltage). Voltages measured for other components required no discernible increase. Though raising voltages allowed the system to pass its intended stability test, Linpack, other errors occurred at overclocked speeds. These errors could not be dependably reproduced upon a system restart. However, any increased chance of error is considered to be unacceptable in a mission-critical environment. Thus, overclocking is not recommended for critical systems, such as servers and workstations.