EXPANDING THE OVERALL EFFICIENCY OF TOMORROW'S DATA CENTERS THROUGH PROCESSOR OPTIMIZATION

William Putnam
Computer Science/Computer Engineering

ABSTRACT: In order to solve the impending issues of data center inefficiencies, mid-level hardware based and software based approaches were studied. A power model based on various processors was observed and calculated in order to determine which type of processor works best given the type of process and the number of instances it must be carried out. In addition, an application that can implement these models over an intranet of data servers was developed. The application allows for toggling of various processors and their cores.

INTRODUCTION

As consumers start to utilize cloud-based services, the data centers that house them can be very inefficient. On average, data centers worldwide consume an average of 30 nuclear power plants' worth of power, as well as a supplement of round-the-clock diesel generators, 73 0 2 Tw 1.241 0 TJ 0 Tc 0 Tw 24.072 0 Td (-)Tj 0.002 Tc -0

Figure 1: The La2cNbnv12(ei)7ew 2cNbppl2cNbte us d fore cuerere n12(et)7e t

small amount of current keeping the processor ready for