

ENERGY EFFICIENT VIRTUAL APPLIANCE DEPLOYMENT FRAMEWORK

Nelson Lee, University of North Carolina at Chapel Hill, USA, leent@email.unc.edu

Vidyadhar Kulkarni, University of North Carolina at Chapel Hill, USA, vkulkarn@email.unc.edu

We propose an energy efficient virtual appliance deployment framework that is applicable to large scale computing systems. This study is motivated by Virtual Computing Lab (VCL) service, which provides a remote access to students allowing them to reserve and use a virtual computer with their desired set of applications. Ideally, each set of applications, stored as a virtual appliance, is preloaded to a server before any user requests it. However, this goal is unrealistic due to the large amount of application sets. Using Erlang-B model, we provide a server scheduling and virtual appliance deployment model that results solutions satisfying performance requirement with energy efficiency. We also evaluate our policies with actual data collected from the VCLs at UNC-Chapel Hill and North Carolina State University.