DEVELOPMENT OF AN ENHANCED ACCOUNTING SCHEME FOR GRID COMPUTING ARCHITECTURE

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A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE (M.Sc.) COMPUTER SCIENCE
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ILE-IFE, NIGERIA

2008

ABSTRACT

This research developed a modification to the Grid Accounting Scheme (Gridbank) by formulating a model to enhance the scheme. The enhanced scheme was simulated and its performance was evaluated with a view to eliminating the manual mode of processing, speed up transaction and reduce time delay.

The Paypal layer was added to the existing three layers which enhanced the scheme to allow the automation of the GridBank administration module. The enhanced scheme was formulated using the web service approach that allowed cross platform interoperability. A web service was created using Hypertext Preprocessor (PHP: a web development language) and My Structure Query languange (MySQL: a relational database management system) for establishing the link between the Paypal system and the existing layers. The scheme was simulated using visual modeler. Processing delay and load scalability were used to assess the performance of the two schemes. The results of the simulated model were analyzed and interpreted. Processing delay was specified as a function of processing time and number of users while load scalability was specified as a function of load and available number of resources during three different periods of operation namely: peak, off-peak and holiday; in order to analyze the model.

The results of the simulation showed that as the number of users increased, the processing time gradually reduced for the enhanced scheme hence the processing delay of the enhanced scheme reduced and its curve had an R^2 value of 0.96. However, as the number of users increased, the processing time increased for the existing scheme hence its processing delay

increased its curve had an R^2value of 0.32. Also as the number of available resources increased the enhanced scheme scaled the load properly with R^2 values of its curves; 0.05 (Peak Period), 0.03 (Off-Peak Period) and 0.42 (Holiday Period) as against 0.02 (Peak Period), 0.01 (Off-Peak Period) and 0.25(Holiday Period) of the existing scheme with less number of resources.

It was concluded that the enhanced accounting scheme provided the required automation for efficient and secure grid accounting operations. This distinguished it from the existing scheme.