

## **ABSTRACT (English)**

Grid computing is a distributed system that breaks the workload into small self-contained units and then assigns them to geographically spread independent computers with the goal of achieving the best performance. The resource intensive scientific and engineering applications were the prime mover behind the development of grid computing systems as they require large amount of resources that cannot be met by a single computer. Grid systems are today being used for running many different types of applications including drug discovery, weather forecasting, economic forecasting, financial analysis, seismic analysis, and back office data processing for large scale e-commerce and web services.

This report presents the work carried out for setting the Sintok-Grid, an extension of the Academic grid Malaysia to the Universiti Utara Malaysia. Setting up a grid site and connecting it to an existing one is not a straight forward task such as installing a server and connecting it to a communication link. It requires to go through several well planned steps including setting up of a right network environment with required security and access controls, the right computing architecture, communication facilities and required middleware services. On top of carrying out these meticulously planned actions, it is necessary to decide the right Virtual Organization and be implemented. Thus comprehensive research was carried out in order to understand the requirements and technicalities of setting up of a suitable grid infrastructure.

The researchers involved in this study underwent several training programmes and attended workshops conducted by leading researchers and practitioners in this field. These trainings and workshops provided them with valuable knowledge and hands-on experience in setting up a grid site bottom up. At the end of the research phase, the researchers developed a comprehensive implementation plan including environment, hardware, software and network designs. The implementation plan identified every step to be followed in detail. Once the detailed plan was ready, the Sintok-Grid was implemented and connected to the A-Grid Malaysia.

During the design phase, several compromises had to be made due to financial constraints. These compromises include running two servers namely IS and SE in one server class computer and hosting the UI in a non-server class computer. But, the researchers were careful that these compromises would not affect the performance and quality of the grid implementation. Finally a comprehensive test was carried out on the operation and security of the grid system.