



Project Proposal

Version 0.5

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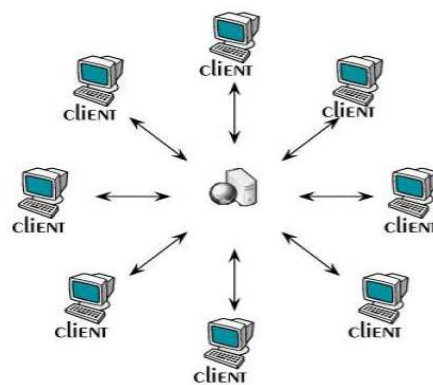
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Introduction

In the present, throughout the world, there are lots of computers which stay on and idle without performing any processing thus wasting the electricity and CPU time. **Moratuwa Open Infrastructure for Network Computing (MOINC)** is a project which enables the users of the idle computers to voluntarily join the MOINC network and let MOINC use the processing power of their computers when the resources remain idle and/or when the user wants, which is beneficial for the users in financial terms as well. The computers throughout the world volunteering to the MOINC together with the MOINC System as a whole, creates a distributed system.



Error! No text of specified style in document.-1 - A Distributed System

In the modern world the usage of distributed systems is not a something very rare. The academia and business organisations opt for distributed systems to gain many benefits such as rapid execution of services, high availability etc. This is beneficial in financial terms as well. The usage of distributes systems increased with the development of the internet and communication protocols such as HTTP.

The MOINC project is not aimed at utilizing resources of individual computers alone. When deployed in an organisation, the organisation will be able to reap many benefits from the system. If we take our university for example we see that there are thousands of computers in various laboratories. However if we count the computers that are involved in some sort of processing, the count goes down to hundreds, thus a huge wastage of resources and energy. If MOINC is deployed in the university, it'll be able to utilize the resources efficiently while being of great service to the world as well. The university will be paid as well for the provided resources. Hence it is clear that MOINC will provide various benefits to any organisation as well.

Problem Description

The energy crisis is a vast problem which the whole world is talking about these days. Even saving a kilo Watt of power is vital at present. Thousands of computers which stay idling on top of desks do not help to reduce this problem.

The Service Oriented Architecture (SOA) is something the world grasped quickly due to its innovative way of providing solutions to many common real world problems. Web services since its inception many years ago caused quite a revolution in providing services to many users around the globe. When it became more mature a lot of organisations made use of it to provide state of the art services without worrying about the platform or the languages people were using.

However though web services have many advantages, the disadvantages can't be totally neglected. Web services suffer the problems of low availability and poor performance under heavy loads and low scalability. Therefore the organisations which use web services have to face these problems when providing services to the community.

Project Objectives

The MOINC project is aimed at giving solutions to both the above problems in a very ground-breaking manner.

It will address the energy crisis by utilizing the computers that stay idle while switched on thus making use of energy resources without wasting them. Therefore organisations won't have to worry about idling machines anymore because MOINC will be utilizing them thoroughly.

This project will address the second problem mentioned above by providing a platform organisations can use to deploy services which takes care of rendering the services and providing results quickly and efficiently. MOINC platform deploys web services on idling computers which enables the services to be more scalable. As plenty of computers will be there to handle the service requests, organisations won't have to worry about low availability of services and they can make sure they maintain the processing power which is unthinkable of achieving from a single computer alone.

MOINC will come to the rescue of any organisation where services in which high loads have to be handled as well. As MOINC will use clustering to provide services, the service requests will be clustered, or in simple

terms divided among the idling set of computers. As many idling computers will set to work on the highly loaded services, they can be handled briskly and guarantees results in minimal time.

In addition to these objectives the key objectives of the client module can be listed as follows. These objectives will be redefined and explained clearly in the System Requirements Specification (SRS) document. Other than the list mentioned below there are several tasks which the client handles. They will also be elaborated on the SRS.

- Observe the local system activities
 - The Client is responsible of notifying the server when it becomes free to get services to process from the server. In order to do so it must monitor the things that happen in the client itself.
 - The Client should also notify the server when the processing time is required by the computer to execute some other task of the client which has no relevance to the services.
- Make room for a SOAP execution environment which takes care of executing the provided services
- Calculation of points based on how much processing power was used. These points will be used to pay the client for the granted processing time.
- Send information about the points, service execution history etc. to the server for later use.
- Should be installable in multiple platforms.

Methodology

The following list indicates the methodologies that our group will be using to develop the Client tool of the MOINC platform.

- MOINC client will be a windows based application which can easily be used in multiple OSs.
- MOINC client will observe the local system and it will notify the sever module whenever the client system is idle or on a time period where the user has agreed on the usage of the system.
- When sending MOINC client request it will send the information about the time period to be used, users agreed system usage limits (Processor , memory and hard disk space)
- MOINC client will be responsible to send the current status of the client to the server module once every few minutes so that the server will know that the client is still processing the task and it will not remove the client form the cluster.
- MOINC is mainly based on using system idle time of the volunteering clients. Hence we have no way of predicting the time span on which the MOINC client will run. Therefore the MOINC client will have a role back mechanism to save the data of ongoing processes and start again when the system is idle.
- MOINC will have an error handling mechanism that it will be able to handle the errors that might occur when transmitting data and executing them.
- The client application will send the necessary information to the server on calculating points which will be used to grade the client.
- MOINC client will have a simple easy to use front end which will give the user the ability to set the usage policies and other basic settings.

Project Scope

When developing the system we will only target the above mentioned features and services at the client tool. The client shall not get involved in the tasks managed by the server module. The client will work with pre-defined set of APIs to communicate thus ensuring unwanted dependencies between the modules are not maintained.



PROJECT PROPOSAL

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