

Designing and Implementing a Communication Model for a Mobile Computational System

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1. Background

A mobile computation can commence execution on one host, recognize a need for a resource located on another host, and migrate to the new host. Dr. Pulimood has created a prototype mobile computation system.

2. Problem Statement

Creating a communication model for a mobile computation system is not a straightforward task. There are many issues that have to be addressed when designing such a system, such as efficiency and security.

3. Goals of the Project

Design and implement the communication model for Dr. Pulimood's mobile computation system

- Examine communication models in various mobile agent toolkits
- Design and implement a communication model for the system
- Determine whether or not communication will adversely affect the performance of the RVM

This project will be completed in two stages:

- 1st stage (Fall 2005) – finalize design for the communication model
- 2nd stage (Spring 2006) – implement the communication model and analyze its performance

4. Major Migration Issues to be Considered

- Message passing v. information space
- Synchronous v. asynchronous protocol
- Push v. pull strategy
- Network transfer protocol (TCP/IP, HTTP)

5. Analysis of Existing Mobile Agent Toolkits

Toolkit	Aglets	NOMADS	Tracy Mobile Toolkit
Programming Language	Java	Java	Java
Type of Mobility	Weak	Strong	Weak
Communication Model	Message passing	Message passing	Message passing
Weakness	Weak mobility (additional overhead)	Uses a modified Java VM	Weak mobility (additional overhead)

6. Overview of Solution

- Will use message passing
- Will use an asynchronous transfer protocol (asynchronous sockets)
- The performance of push and pull strategies varies in different situations; some toolkits support a combination of the two strategies

7. Conclusion and Future Work

- Design of the communication model will be completed by the end of the semester
- Implement the communication model
- Analyze the performance of the communication model