Abstract

The concept of distributed computing implies a network/internet-work of independent nodes which are logically configured in such a manner as to be seen as one machine by an application. Over the last two decades, the concept of distributed computing has been implemented in varying configurations and on diverse platforms for the optimal processing of data. The salient payoffs of distributed computing may be listed as:

- Enhanced performance (in respect of both speed up and scale up).
- Resource sharing (in respect of data as well as hardware and software processing elements).

To optimize the internet-works (including networks), by the use of distributed computing concepts, an agent based Dynamically Distributed Service (DDS), is proposed, which can be made available on demand, in an intranet/inter-network. This service will conceptually migrate an application on to different nodes using agents. This Dynamically Distributed Service (DDS) should not be at variance with distributed paradigms used till date, no changes to the underlying hardware or OS are proposed in its implementation. Process intensive applications will be the main beneficiaries of the scheme.

In this dissertation, a proposal has been presented for the mobility of agents between various agencies, based on the agent communication language (ACL) proposed by FIPA. This work solves the problem of interoperability in mobile agent systems, probably, one of the main obstacles
to the deployment of this technology. Also the study suggests feasible solutions to counter the challenges faced to efficiently utilise the network resources. The problem is hard due to the distributed nature of computer networks, high communication demands and the desire for limited communication overheads. One solution to such challenges is to design efficient, decentralized and fault-tolerant data propagation model which accomplishes tasks with no access to global network information. Mechanisms of agent propagation are useful because agents can be organised into efficient configurations without imposing external centralised controls. Operation without a central coordinator eliminates possible bottlenecks in terms of scalability and reliability. The contribution of this work lies in the fact that by data propagation in a network (provided by DDS) execution time can be considerably reduced. Agents with their ability to react on changes in the environment, i.e. changes in the number of agents on a node, are able to adapt to current conditions using migration.