Study on Service Management in Distributed Object Environment

Sunao Tomita (110088)

School of Information Science,
Japan Advanced Institute of Science and Technology

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1 Introduction

In recent years, distributed processing environment and commercial WEB service system is constructed based on distributed object. Distributed object is the technic which object component, as a smallest part of object oriented program, deployed on computer network. By communicating with each objects in the network, distributed object system implements distributed processing and provide flexibility of physical deployment.

There are many kind of frameworks for creating program with distributed object. Distributed object framework is the implementation and/or specification of service which serve solution for basic problems in constructing more complex distributed object system.

Naming Service is one of the important service. Naming Service acts as object repository in distributed object environment. By registering object and object's name among services, client can sarch object by its name. Naming service is a very important service in a system. Without loadbalancing or multiplexing for naming service, the system will lose throughput or reliability. There is federation to implement load balancing and multiplexing. Federation can provide one service by connecting many services.

On this study, the goal is to construct HCN(Hierarchical Controlled Network) for realizing load balancing and multiplexing for naming service hierarchy. For implementation, we made hierarchically connected naming server and defined some internal behaviours to register and to reffer to object. As for the experimentation, we evaluated the performance of HCN in distributed object environment using simulation.

2 Introducing Hierarchy and Internal Behavior

User can decide hierarchy as one's like by clients deployment. When client uses naming service, user has to create HCN proxy. HCN proxy stored the path from client to root naming server. If client wants register or refer to naming service, client have to issue appropriate operetion for HCN proxy. When receiving operation, HCN proxy will register or refer to an object by following the existing path, then the result will be sent back to the client.

3 Evaluation by Simulation

HCN is targeted for large scale distributed object environment. It is difficult to evaluete by physical machine and network. Therefore, we construct simulation environment in order to evaluate HCN's performance. We've carried out the simulation for 256, 1024, 4096 clients. The naming server itself is structured as a binary tree.

From the simulation results that we have obtained, the results of experiment with 256 clients shows no significant difference between naming service time and service time. In the other hand, for 1024 and 4096 clients, the naming service time is longer than service time in level-2 HCN, but the service time become longer than naming service time in level-3 HCN. From these results, we can conclude that if more clients is being used, the bottle-neck is shifted from naming service to the service itself.

Herefrom, HCN can load balancing in naming service for middle to large scale distributed object environment.

4 Conclusion

In this study, we have proposed HCN to realize federation for naming service.

To avoid concentration of load on naming service, we construct naming service hierarchically. We also hava constructed simulation environment to evaluate HCN. From this result, we can confirm that HCN reduces load on naming service for middle to large distributed object environment.