

Neighbor Caring Environment System (NCE) Using Parallel Replication Mechanism

Authors : Ahmad Shukri Mohd Noor, Emma Ahmad Sirajudin, Rabiei Mamat

Abstract : Pertaining to a particular Marine interest, the process of data sampling could take years before a study can be concluded. Therefore, the need for a robust backup system for the data is invariably implicit. In recent advancement of Marine applications, more functionalities and tools are integrated to assist the work of the researchers. It is anticipated that this modality will continue as research scope widens and intensifies and at the same to follow suit with current technologies and lifestyles. The convenience to collect and share information these days also applies to the work in Marine research. Therefore, Marine system designers should be aware that high availability is a necessary attribute in Marine repository applications as well as a robust backup system for the data. In this paper, the approach to high availability is related both to hardware and software but the focus is more on software. We consider a NABTIC repository system that is primitively built on a single server and does not have replicated components. First, the system is decomposed into separate modules. The modules are placed on multiple servers to create a distributed system. Redundancy is added by placing the copies of the modules on different servers using Neighbor Caring Environment System(NCES) technique. NCER is utilizing parallel replication components mechanism. A background monitoring is established to check servers' heartbeats to confirm their aliveness. At the same time, a critical adaptive threshold is maintained to make sure a failure is timely detected using Adaptive Fault Detection (AFD). A confirmed failure will set the recovery mode where a selection process will be done before a fail-over server is instructed. In effect, the Marine repository service is continued as the fail-over masks a recent failure. The performance of the new prototype is tested and is confirmed to be more highly available. Furthermore, the downtime is not noticeable as service is immediately restored automatically. The Marine repository system is said to have achieved fault tolerance.

Keywords : availability, fault detection, replication, fault tolerance, marine application

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