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INCREASE THE EFFECTIVENESS OF DISTRIBUTED DATABASE SYSTEMS

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Abstract

In this paper we consider fundamental rules of distributed database systems. Studied some fundamental rules, which may increase the efficiency of distributed database systems.

It's widely used distributed systems (DS) [1] in modern information technology. DS is a system consisting of various components that interact with each other through messages in the network. One of the most interesting areas of the DS is a distributed database (DDB) is a distributed system, in which the nodes act as the database [2]. Many systems work with data that they have to store, manage and operate, so the DDB are one of the topical areas to date.

In turn, DDB must satisfy twelve basic rules: local independence, lack of dependency on the central site, continuous operation, regardless of the location, independent of the fragmentation, independent of replication, distributed query processing, distributed transaction management, hardware independence and independence from the operating systems.

Following the fundamental rules and they maintaining give to DDB properties such as fault tolerance, scalability, uptime and flexibility for the application of information systems performance. Consider just these fundamental rules, which help you to achieve better performance for DDB.

Local independence - this property indicates that the nodes are combined into a single DS, but despite this, each node locally is an independent unit that functions independently of other nodes in the system.

For example, the technology Real Application Cluster (RAC) of Oracle [3,4]. DS keeps working capacity in the event of failure of some nodes in the cluster, the system automatically redistributes the load on the remaining operational nodes. With RAC may increase the number of nodes due to DS, which is possible to achieve better performance of the system.

Independence from fragmentation - fragmentation is the division of information into several portions and the distribution of those portions of the various disk space. In this case, the data can be stored in a place where they are most often used, which allows for the localization of most of the operations and reduce network traffic, thanks to a gain in performance of the system.

Independent of replication - replication is to store multiple separate copies (replicas) that are stored on a few selected sites. Define replication as well as the generation and reproduction of multiple copies of data to be placed on one or more sites. With this approach, you can replicate data across multiple nodes, where they are most often used, which allows for the localization of most of the operations and reduce network traffic, thanks to a gain in performance of the system.

Distributed Query Processing - distributed query, this query requires the query is not locally on the node, this query executes on the nodes of DS. Therefore, when performing distributed queries is very important mechanism which allows the definition of nodes, which are necessary to execute the query objects.

Distributed transaction management - this requirement is also true for the DDB, since independence from the DS or the usual transactions of property must meet ACID properties (atomicity, consistency, isolation, durability).

Also in the actual management of DS parallelism, most of the systems used to maintain concurrency locking mechanism, although in recent times is also widely used method of support for many versions. Proper use of technology parallel processing of queries in the system, improve system performance is achieved.

Thus, this paper studied the fundamental rules by which is possible to achieve better performance of distributed systems.

References:

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