ANALYSIS OF MULTIMEDIA DATA REPLICATION METHODS

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This work is devoted to the analysis of existing methods of data replication when using the scheme of increasing fault-tolerance of servers with multimedia content. It analyzes such methods as detachment/attachment method, one-way and two-way replication methods.

Data replication is an important mechanism for ensuring data integrity. For all these replication types, the multimedia data of the primary server must be used as a data source to create a replica. All types of such data are supported in both network-connected and standalone environments [1-5].

So, let us analyze these replication methods:

- attached/detached replication allows you to edit the data of a child replica and then synchronize those changes with the parent replica;
- one-way replication allows for repeatedly sending data changes either from the parent replica to the child replica, or from the child replica to the parent replica;
- two-way replication allows sending data changes from the parent replica to the child replica or from the child replica to the parent replica multiple times. If the same row is edited in both replicas of the multimedia database, a conflict will be detected when the replicas are synchronized. Reconciliation policies are available to resolve conflicts.

Next, it is reasonable to analyze the circumstances when it is appropriate to choose one or another type of replication.

If it is necessary to create a replica in personal or file databases of multimedia data, one should use detached/attached or unidirectional replications.

However, if licensed media content is used to edit the data of a child replica, then personal media storage databases of system users should be used as the target database.

Using such a media database instead of a shared or file database will allow two-way replicas to be created. By using two-way replicas, it is possible to synchronize changes many times without having to create replicas again.

One-way replication would be ideal if there is a need to publish changes from the main production server to the server that publishes data to a specific user community (topic group).

One-way replication provides one-way synchronization of changes and does not require the child replica data to be versioned when using a simple data model.

When using a simple model, the fact that the types are simple makes the data more versatile because it does not need to conform to complex data structures, such as Esri.

When implementing a one-way system, where the child replica data may sometimes need to be edited, two-way replication should be used. Because one-way replication will have the child replica data as read-only, synchronization can overwrite changes made to the child replica data.

The two-way replication conflict detection logic will flag these differences as conflicts. This will allow the system to decide how these differences should be resolved. Two-way replication allows data to be exchanged in both directions, but it will also work in cases where you only need to send changes in one direction.

Thus, this analysis shows in which cases it is reasonable to use one or another type of multimedia data replication.

The using of the proposed solution significantly simplifies the stage of designing and creating large distributed systems for storing large amounts of multimedia data. The quantitative effect is about 8-10 percent compared to other approaches.

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