Mizu VoIP Server –High Availability Database

For VoIP service general availability, please refer to the VoIP Server High Availability guide.
This document discusses the internal architecture of the Mizu VoIP system to implement high database availability.

The Mizu VoIP server stores all settings and data in a database, thus the database availability and redundancy is a key point implementing a highly available VoIP system.
High VoIP database availability is implemented by duplicating the main database to one or more remote locations and failover or switchover to the secondary instance in case when the active database fails or can't be used for any reason.
For this reason you will need to use at least two servers, however the same servers can be used also as VoIP app server or if your traffic is low then you can use the same servers also for other purposes or use virtual servers for easier management.

There are multiple ways to implement database high availability and they can be compared by a few metric:

- Administrations costs: how easy/difficult is to implement and maintain
- Hardware costs: how much extra hardware/CPU/RAM/disk is needed
- Data loss: how much data can be lost at a failure event ("high" doesn't mean very bad and it might be the optimal for your use case)
- Service availability: how fast the database failover can be achieved
- Failover: how the failover will be performed. While the SQL engine doesn't support failover for all methods, you can always use the Mizu VoIP server auto database failover feature.

HA methods:

Replication

Database replication will synchronize tables to one or more replica.

- Administrations costs: high (difficult setup, problems related to differences between copies)
- Hardware costs: high
- Data loss: no or low
- Service availability: medium
- Failover: by the VoIP server

Log shipping

Log shipping will stream the transaction logs to other server(s) which will continuously restore them.

- Administrations costs: medium
- Hardware costs: medium
- Data loss: low or medium
- Service availability: medium
- Failover: by the VoIP server

Mirroring

Database mirroring maintains two copy of the same database. This feature might be removed in future releases.

- Administrations costs: medium
- Hardware costs: medium
- Data loss: low
- Service availability: high
- Failover: supported by the SQL engine

Clustering

Always On Failover Clustering uses multiple servers with a shared storage depending on OS cluster features.

- Administrations costs: high
- Hardware costs: high
- Data loss: no
- Service availability: high
- Failover: supported by the SQL engine

Always On Availability Groups

Always On Availability Groups provides a cluster without the need of a shared storage and can be configured by database.

- Administrations costs: high
- Hardware costs: medium or high
- Data loss: no
- Service availability: high
- Failover: supported by the SQL engine

Backup

Database backups can be also used to implement near continuous availability.

- Administrations costs: low
- Hardware costs: low
- Data loss: medium or high (depending on diff backup frequency)
- Service availability: medium
- Failover: by the VoIP server

File backup

File backups is a supplementary method that can be configured from the Mizu VoIP server to minimize data loss between two database backups.

- Administrations costs: low
- Hardware costs: low
- Data loss: low or medium
- Service availability: medium
- Failover: by the VoIP server

Choosing the optimal method

You should select and implement the database availability method and level based on your business needs and possibilities.

- No off-time and no data loss: Always On Availability Groups + SQL auto failover
- Minimal off-time and minimal data loss: Log shipping + SQL auto failover

- Medium off-time and medium data loss: Database backups + file backups + VoIP server failover
- High off-time and high data loss: Backups + manual failover
- Disaster (only for testing or for development purposes): no backups

For a typical VoIP install we often recommend the database backup + file backup + VoIP server failover method.
This method combines ease of use, low costs and enough availability for most businesses.
While the data loss and service availability is marked as medium, considering the 10 years average hardware failure, this method can still achieve 99.999% availability which is more than enough for a typical VoIP business.

Related

Softswitch webpage
Large scale VoIP webpage
High availability VoIP
High availability database