

No. 20 – Database Redundancy

Database Usage

IPNx, Soft IVR and SoIP switches have an internal database which is used for a number of real time tasks that affect call routing and customer features.

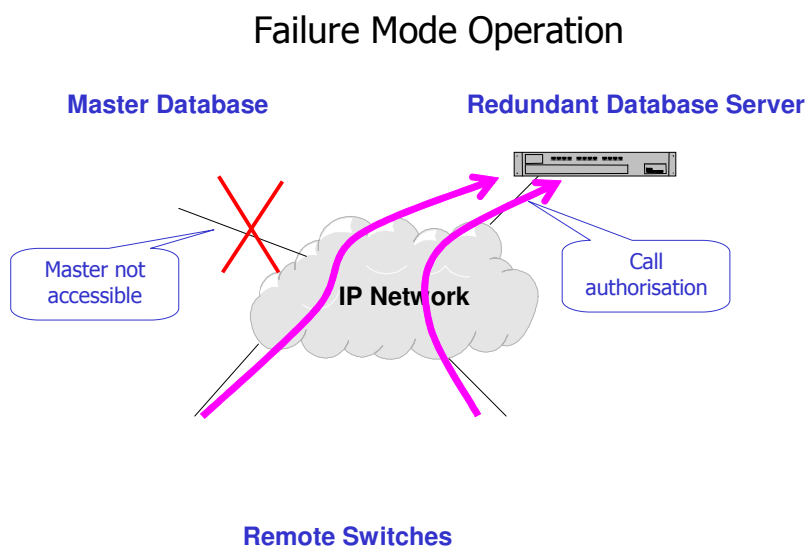
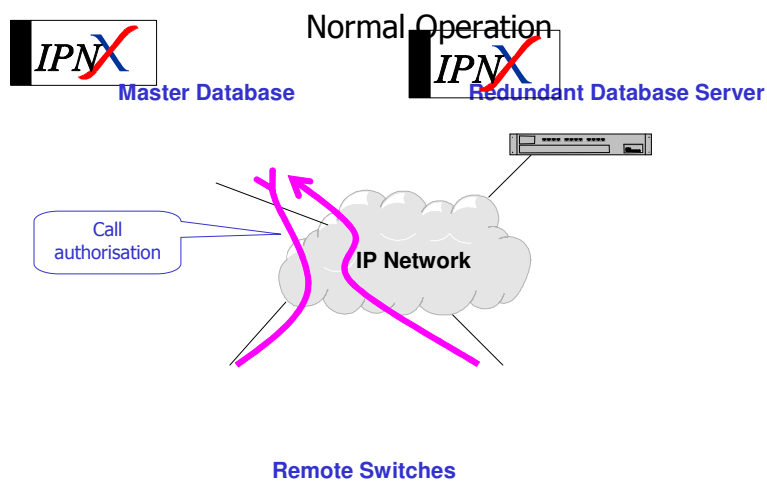
The main use of the database is to hold the current balance for the different classes of subscriber. These balances are checked to see if a call can be allowed. In a multi-switch network one switch database is normally nominated as the 'Master' database and this is checked for balance enquiries for calls made anywhere in the network. It is clear that any failure of the switch holding the Master database or the route to that switch would cause a significant problem for the authorisation of calls. It is this potential problem that the Database Redundancy feature of the WTL software addresses.

Database Redundancy feature

It is possible to replicate the master database on one or more slave databases. The slave database(s) may be local or remote. If database redundancy is enabled then an update process runs which writes any changes to the Master to the Slave's database. This update process can be configured to run at any interval between 60 seconds and 20 minutes.

Failure Mode

If a switch tries to query the Master database there are a number of reasons why it may fail. The 2 most common reasons are a) failure of the route to the Master and b) power or equipment failure of the Master. At this point the query will be redirected to the backup database. Because of the Redundancy feature the backup database will contain very similar information to the Master (depending on the update frequency selected, it will be between 60 seconds and 20 minutes out of date).



Recovery Mode

During failure mode WTL switches maintain the amount of expenditure on each account as calls are made. These are charged on the balances of the redundant database server. When the master database is again accessible, it will upload these newer balances from the redundant server and use them to synchronize the central balances. This mechanism ensures that no information is lost even if the balances on the redundant server were slightly out of date at the time of the Master's failure.

Network Designs

A number of network designs are possible using the Database Redundancy feature:

1. Dedicated Redundant Database Server

A dedicated database server is available which performs no switching and acts purely as a backup for the IPNx/SoftIVR database. This unit can be co-located with the central switch of a network or could be placed in a secondary location for security.

Databases covered:

Database of balances. This is split into 3 subsets

- a) PIN (post paid)
- b) Comp (business accounts)
- c) Debit (pre-paid)

Quick database (the database of subscriber created speed dial numbers)

Note: CDR storage is not affected by this feature. CDRs are always stored on the switch where the call is initiated.