No. 10: WTL Power LCR

World Telecom Labs has developed "Power LCR" a sophisticated set of least cost routing features for the WTL family of switches. This allows routing flexibility normally only found with costly Class 5 switches. A key feature of the WTL platform is that routing is not dependent on the type of traffic. The following details refer equally to calls that arrive in the switch via VoIP, ISDN or SS7.

Routing:

Routing of a call is possible based on:

- Customer (incoming CLI, Pin number, incoming trunk, source IP address etc.)
- Destination number
- Load-balancing requirements
- DDI
- Bearer capability (TMR), for example to route voice and data calls differently
- Origination of call from payphone.
- Incoming route
- Outgoing carrier (Destination number, outgoing trunk etc.)
    - On destination number routing can be specified with up to 16 digit resolution
- Time
    - Day of the week
    - Time of the day
    - Holidays
- Release cause (various errors caused in the network)

A key advantage of the Power LCR is that all the parameters can be changed on the fly while the switch is running without any down time for the operator.

Total Numbering Flexibility

The WTL switch software contains extremely flexible and sophisticated routing based on up to 16 destination digits. This includes smart number matching with exact or partial matches for the dialed number. Prefixes and leading zeros may be stripped or added. There is no need to list every single different possible code in the tables. Number ranges or groups of dial codes can be created to make maintenance of the routing tables more manageable. For example, a Route Group could be created for "Brazil mobile" which included all the relevant dial codes. Only the Route Group record would then need to be modified if the outbound route for Brazil mobile calls changed.

Fallback to Alternative Routes:

The fall back to an alternative route can happen based on following parameters:

- Carrier is full (Carrier not available)
- Transfer medium requirement (TMR). For instance if a chosen carrier does not offer 64K ISDN call then there can be a fallback to another carrier that does.
- Call setup time out
- Invalid data in WTL switch routing table
- Internal errors in WTL switch

- Any other release causes coming from the network (whether ISDN, SS7 or Analog) can be used to trigger fallback. This feature is programmable per outbound carrier.
- User specified causes (a carrier can decide to use an alternate route based on receiving from the network certain causes that are important for him).

The WTL switch software can even change the release cause that it receives from the outbound carrier, so that the originating carrier sees a different reason for call release.
Note: Up to 10 fallback carriers can be programmed for use selected from the 100 definable.
Where no alternative carrier exists the call will be rejected and a message of the operator's choice can be played to the subscriber.

Allowed / Blocked Numbers (White List / Black List)

It is possible to use the routing capability of the WTL switch software to create destinations that subscribers are allowed or not allowed to access. These destinations may be as precise as lists of individual barred numbers or as general as dialing codes or say, international calls. This allows the creation of dialing plans for different groups and classes of users. Dialing plans can be associated with groups of users in order to make the administration easier. There is no limit to the number of different dialing plans or user groups that can be created.

Gateway Function:

A special variant of the Power LCR exists which allows a WTL switch to be used as a gateway to transport traffic from one trunk to another unconditionally or conditionally. This feature is particularly useful to run any kind of Exchange function, trading traffic between carriers.
The outgoing E1 trunks can be reserved based on:

- The customer
- A selected outgoing carrier

Load balancing on outbound carriers

Facilities are available to control the way calls are shared between outbound carriers. Both simple, sequential routing and more sophisticated algorithms are available.
In the simple case calls are presented to the carriers in the routing table in the fixed, priority order that they appear in the rerouting list for a destination. The switch sends all the calls to the carrier on the top of the list and then, if that call attempt fails (carrier is down or full), to the second carrier, etc.
The other algorithms allow:

- Sending a fixed percentage of calls to a carrier
- Load balancing the calls across a number of carriers

The Route table allows 5 carriers in the rerouting list. This table allows control of the order and the content of the carrier rerouting list. For example, X% of the calls may be sent to the top carrier and 100-X%% of the calls will skip the top carrier and will go directly to the second carrier.

These features may also be combined to create a complex rerouting scheme: load sharing with fixed overflow routing, load sharing with overflow to another load sharing, etc.

Note that in this case a Carrier may be a VoIP trunk to any IP address.