Least Cost Routing

DESCRIPTION

NOTICE

The information contained in this document is believed to be accurate in all respects but is not warranted by Mitel Networks™ Corporation (MITEL®). Mitel makes no warranty of any kind with regards to this material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. The information is subject to change without notice and should not be construed in any way as a commitment by Mitel or any of its affiliates or subsidiaries. Mitel and its affiliates and subsidiaries assume no responsibility for any errors or omissions in this document. Revisions of this document or new editions of it may be issued to incorporate such changes.

TRADEMARKS

1 GENERAL

Least-Cost Routing (LCR) is a function, based on destination and time of day, that allows the system to automatically select the most economical route for an outgoing public call.

-	Cost saving	Outgoing calls are routed over the cheapest available route.
-	Easier for the user	The user does not have to choose the cheapest route. This is instead performed automatically by LCR.

1.1 GLOSSARY

For a complete list of abbreviations and glossary, see the description for *ACRONYMS, ABBREVIATIONS AND GLOSSARY*

2 FACILITIES

2.1 GENERAL

The LCR feature includes functions for the following:

- Route selection (including Handling of Conflict Numbers and Addition of Own Area Code)
- Addition of prefix "1" (Office Code)
- Deletion of Area Code
- Expensive Route Warning Tone
- LCR Class of Service
- Dial tone upon reception of LAC

Users of LCR can be PBX operators, Voice, and Incoming Tie lines.

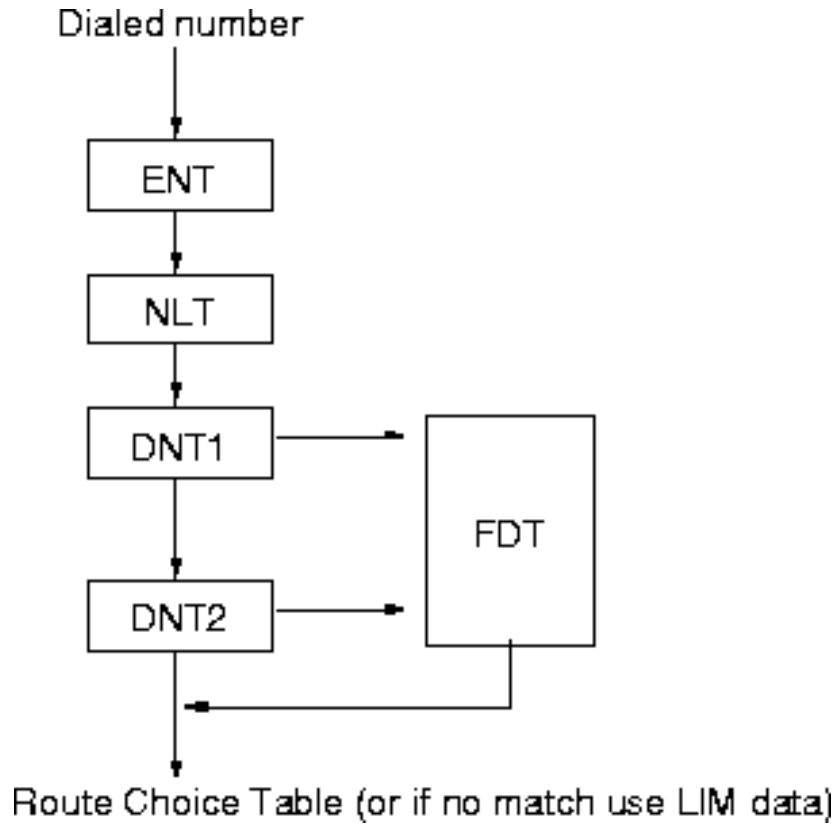
2.2 ROUTE SELECTION

The function for route selection is realized by means of analysis tables. After a dialed number is analyzed, the call is handled according to the data specified in the tables.

The following are analysis tables:

- External Number Table (ENT)
- Number Length Table (NLT)
- Destination Number Tables (DNT1 and DNT2)
- Fictitious Destination Table (FDT)

The order in which a number is analyzed in these tables is shown below.



External Number Table

For each number stated in the ENT, the following data may be given:

- Number of leading digits to delete
- Digits to insert at the beginning of number
- Indication of whether the number is a conflict number (conflict numbers are those with the same leading digits but with a different number length; for example, if both 12 and 123 are valid numbers, they are in conflict and a time supervision has to be performed after the second digit in order to see if any more digits will arrive).

If no match is found for a dialed number in the ENT, the number will next be analyzed in the NLT.

Off-net to on-net conversion:

The function off-net-to-on-net conversion is realized by means of the ENT table. By initiating numbers that are to be found in the own exchange or within the private network as entries in the ENT table, LCR can convert these numbers to any complete or incomplete internal or external number.

Number Length Table

For each number stated in the NLT, the following data may be given:

- Number of leading digits to delete
- Digits to insert at the beginning of number
- Indication of whether the number is a conflict number
- Maximum number length
- Minimum number length

- Indicator telling if the area code is to be inserted between the LAC and the rest of the analyzed number

If no match is found for the dialed or rearranged number in the NLT, the number will next be analyzed in the DNT.

Destination Number Table

The Destination Number Table is divided into two tables, the Exceptions Table (DNT1) and the Number Table (DNT2).

DNT1 holds those numbers which are exceptions to the more general analysis cases that exist in the Number Table. This means that a number which is to be analyzed is first matched to the numbers in DNT1, and, if found there, the Destination Number analysis is completed. If the number is not found in DNT1, DNT2 is tried.

For each number stated in DNT1 and DNT2, the following data may be given:

- Number of leading digits to delete
- Digits to insert at the beginning of number
- Information whether an account code is required
- Index to the FDT where the selected destination code is stored
- Indicator telling which Toll Restriction Class of Services are allowed to complete the call
- Information telling what type of external number the dialed (or rearranged) number is
- Information telling which Transit Network Selection to use for this destination
- Information telling which local or network operator to access for this destination (Operator System Access).

When the LCR analysis is completed, the resulting number is analyzed in the external analysis in order to find a Route Choice Table (RCT). This RCT contains one first-hand route choice and up to seven alternative route choices.

For each route choice, the following data is stored:

- Route number
- Indicator telling if this route choice is marked for threshold 1 or threshold 2 or none (2.8 LCR Class of Service on page 8).
- Indicator telling if this route choice is marked for sending of Expensive Route Warning Tone (2.7 Expensive Route Warning Tone on page 8).

Capacity

The maximum number of entries for the different tables are as follows:

Table	No. of entries	Max. No. of digits per entry
ENT	50,000	16
NLT	1,000	6
DNT1	35,000	16
DNT2	35,000	8
FDT	72	-

2.3 TIME OF DAY

Least Cost Routing, Time of Day allows the system to make the selection of the most economical route for an outgoing call depending on the time of day and the day of the week.

This means that it is possible to always select the most economical route, even if the cost relations between the different routes vary with the time of day and day of the week.

The dependence on the day of week is achieved by dividing the week into three periods, Monday to Friday, Saturday, and Sunday.

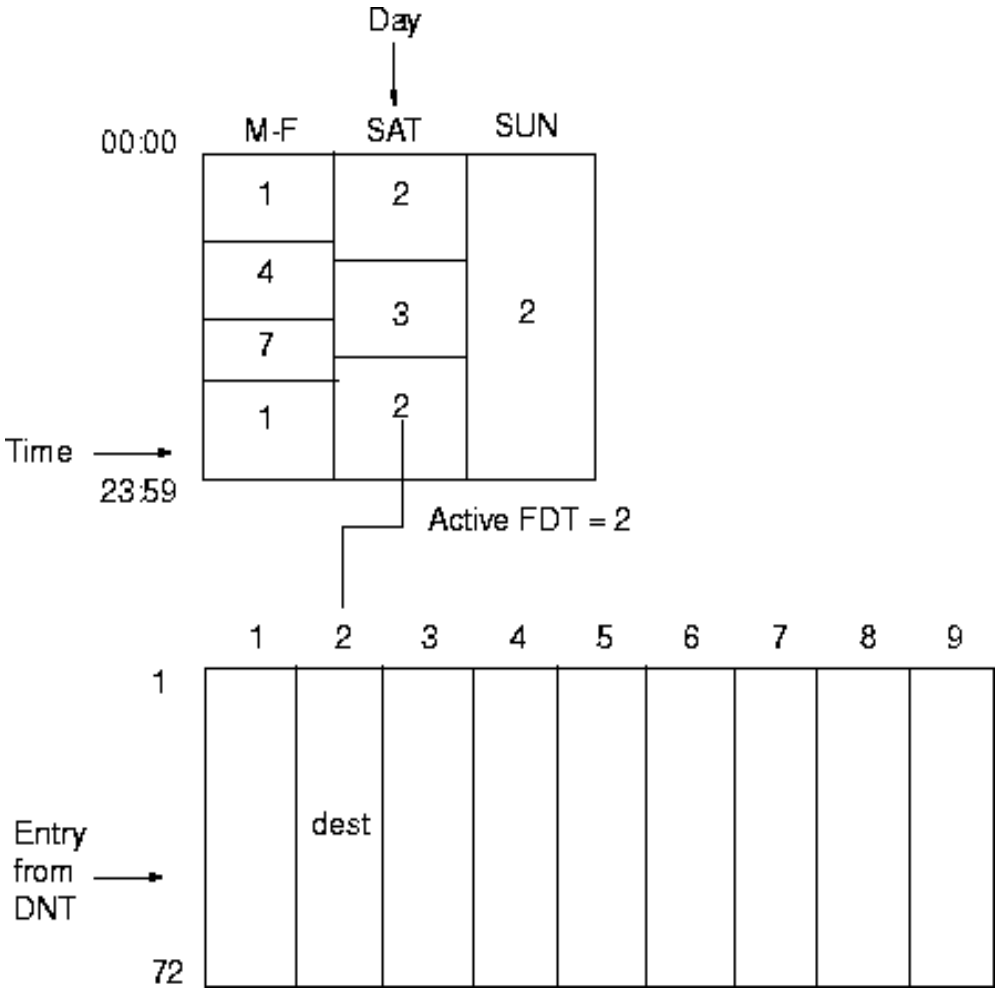
For each of these so-called day groups, the 24-hour period may then be divided into one to three intervals which together will cover the whole 24-hour period.

Thus, there are three day groups, each with three time intervals. The time intervals may be defined differently within the different day groups.

The FDT for LCR is divided into nine tables with 72 entries each. Determined by the time function, only one of these tables is active at any time.

For each index from the DNT for LCR to the FDT, it is thus possible to define nine different external destinations. Which external destinations will be selected for a specific call is dependent on the table that is active at the moment.

See the figure below.



2.4 OFF-NET-TO-ON-NET CONVERSION

LCR has the ability to recognize that a dialed external number is actually an extension in the own exchange or an extension within the private network.

By using the ENT table, LCR has the ability to convert any dialed external number to the corresponding internal or private network number.

2.5 PREFIXING AN OFFICE CODE

(Only for numbering plans of North American type.)

The area where a route terminates may contain office codes (of the value range 200 - 999) that require a "1" prefix. The Office Code Prefix Table stores all the office codes which require the "1" prefix.

The system can hold up to 15 OCPTs. More than one route may refer to the same OCPT.

2.6 DELETION OF AREA CODE

On a route basis it is possible to specify the area code in which the route terminates. When a call is placed over that route and the dialed area code is the same as the area code of the route, the dialed area code is deleted.

2.7 EXPENSIVE ROUTE WARNING TONE

One of the alternative route choices in the RCT may be marked for sending the Expensive Route Warning Tone. This means that before a trunk is seized in this or any of the following alternatives, a tone must be sent to the user indicating that a trunk in an expensive route will be used for routing of the call. This tone will be sent for a preset number of seconds during which time the user has the possibility to interrupt the further routing of the call.

2.8 LCR CLASS OF SERVICE

The users LCR Class of Service determines how far in the RCT the routing may advance. The meaning of the different values are shown below:

LCR	COS Meaning
0	Allowed to use all routes up to threshold 1.
3	Allowed to use all routes.

2.9 DIAL TONE AFTER DIALING LAC

Optionally, it is possible to send a dial tone to the user upon reception of the dialed LCR Access Code.

3 SUMMARY

The feature LCR is a function for automatic selection of the most economical route for an outgoing call.