

LCR - Least Cost Routing



Overview

Least Cost Routing (LCR) allows users to intelligently select the ITSP provider to route the traffic based on the cost for a certain destination number.

This feature works in tandem with the SIP Trunking functionality provided by NSC. To deploy this feature, the following elements are required:

1. Multiple rate lists provided by your ITSP
2. Each rate list provided should be formatted as a CSV file which can be uploaded into NSC (you can convert spread sheet documents to CSV easily using the 'Save As' menu from your spread sheet software)
3. SIP Trunk(s) to the ITSP should be created already
4. If an ITSP provides a rate list and more than one SIP Trunks using this rate list, a distribution list needs to be created for those SIP trunks (See **"Configuration -> Load Balancing"** in the web interface menu)

When all the elements above are ready, you need to create an LCR carrier for each rate list and then add few lines in your routing plan to look up the LCR table (using the "lcr" application) and perform the LCR routing.

Prepare the rate list CSV files

The contents of the CSV file are expected to be divided in 8 columns:

- digits (mandatory): Matching digits that are used to compare the destination number in routing plans using the "lcr" application
- rate (mandatory): Decimal value to indicate a relative cost of using this entry
- lead_strip (optional): How many digits to strip off the start of the matching number, the stripping is done after matching the digits
- trail_strip (optional): How many digits to strip off the end of the input number, the stripping is done after matching the digits
- prefix (optional): Digits to add in front of the the destination number after stripping has been performed
- suffix (optional): Digits to add at the end of the destination number after stripping has been performed
- date_start (optional): Begin date when the rate is valid
- date_end (optional): Date when the rate stops being valid

See below 2 CSV example files for "Carrier A" and "Carrier B"

carriera.csv

| | A | B | C | D | E | F | G | H |
|---|--------|----------|------------|-------------|--------|--------|------------|----------|
| 1 | digits | rate | lead_strip | trail_strip | prefix | suffix | date_start | date_end |
| 2 | 1777 | 0.006916 | | | | | | |
| 3 | 1778 | 0.008554 | | | | | | |

carrierb.csv

| | A | B | C | D | E | F | G | H |
|---|--------|----------|------------|-------------|--------|--------|------------|----------|
| 1 | digits | rate | lead_strip | trail_strip | prefix | suffix | date_start | date_end |
| 2 | 1777 | 0.007916 | | | | | | |
| 3 | 1778 | 0.005554 | | | | | | |

SAMPLE CSV LCR-sample.csv

Create LCR Carrier

Go to "Configuration" -> "Routing" -> "LCR Carriers", add a new LCR carrier and then choose from "SIP Trunk/Load Balancing List" the created SIP Trunk "Trunk_To_Carrier_A":

Carrier - CarrierA

Enabled Enabled ▼ ⓘ

SIP Trunk/Load Balancing List SIP -- Trunk_To_Carrier_A ▼ ⓘ

Save Cancel

Click the "Save" button:

Carrier - CarrierA

Enabled Enabled

SIP Trunk/Load Balancing List SIP -- Trunk_To_Carrier_A

Edit Cancel

Carrier Rates File

No Carrier Rates File

Upload

Click the "Upload" button in "Carrier Rates File" to upload rate list:

Carrier - CarrierA

Enabled Enabled

SIP Trunk/Load Balancing List SIP -- Trunk_To_Carrier_A

Edit Cancel

Carrier Rates File

🔍 10 ▼ Showing 1 to 1 of 1 entries ⏪ ⏩ 1 ▼ ⏪ ⏩

| Enabled | Description | File Name | Rate Count | |
|---------|-------------|--------------|------------|---|
| Enable | | carriera.csv | 2 | Edit Download Delete |

Upload

Repeat above steps for all the rate lists.

| Carrier | | | |
|-------------------------|---------|-------------------------------|---------------|
| <input type="text"/> 10 | | Showing 1 to 2 of 2 entries | |
| Name | Enabled | SIP Trunk/Load Balancing List | |
| CarrierA | Enabled | SIP -- Trunk_To_Carrier_A | Modify Delete |
| CarrierB | Enabled | SIP -- Trunk_To_Carrier_B | Modify Delete |
| Add | | | |

Using the LCR Database

Once the LCR internal database is created, you can start using LCR routing now from both the advanced and basic routing plan engines:

Basic Dial Plan

Rule - Rule_159

Condition

Description: Rank: 30

Matching: All Stop Policy: Stop On Success

Condition: Standard Information Name: Destination Address Expression:

Actions to perform if condition matches

Action: Custom Application: lcr Data:

Action: Custom Application: bridge Data:

Actions to perform if condition doesn't match

Action: (Please Select One)

Save Save & Apply Cancel

Advanced Dial Plan

```
<condition field="destination_number" expression="^(.*)$">
  <action application="lcr" data="$1"/>
  <action application="bridge" data="{lcr_auto_route}"/>
</condition>
```


e.g. when number "17771234567" is dialed and hit above routing plan, "17771234567" is passed to the lcr look up function. The lookup result is saved to channel variable "lcr_auto_route". Since the rate of "1777" from CarrierA is 0.0069 and 0.0079 for CarrierB, CarrierA will be tried first; if the carrier is not available (e.g. the SIP trunk is down), then CarrierB will be tried.

When you change the dialed number to "17781234567", since CarrierB for "1778" is cheaper than CarrierA, then CarrierB will be tried first.

Using Load Balancing List

If you get 2 or more SIP Trunks from the same ITSP provider, you can setup a load balancing list using the same rate list.

Configuration > Routing > **Load Balancing**

 This page allows managing Load Balancing configuration.
✔ System started.
● Configuration modified.

Load Balancing

Enable Load Balancing **Enable**

Generic list

No Generic list

SIP Trunk List

10 ▾ Showing 1 to 1 of 1 entries

| Name | Enable List | Description |
|------------------|-------------|-------------|
| SIP_Trunk_List_C | Enable | |

In the Load Balancing SIP Trunk List "SIP_Trunk_List_C", there are 2 resources: SIP Trunk C1 and C2 and you can set their "weight" to decide which one will be used more often.

SIP Trunk List - SIP_Trunk_List_C

Enable List **Enable**

Description

Resource

10 ▾ Showing 1 to 2 of 2 entries

| SIP Trunk | Weight | Description |
|---------------------|--------|-------------|
| Trunk1_To_Carrier_C | 1 | |
| Trunk2_To_Carrier_C | 9 | |

Create an LCR Carrier using the load balancing list as the destination:

Carrier - CarrierC

Enabled

SIP Trunk/Load Balancing List

Whenever this carrier is chosen the calls will be load balanced across all SIP trunks members of the load balancing list and according to the specified weight and availability of each one.

Update of rate list for a specific LCR carrier

Rates are always changing, when an update comes for one ITSP provider, please:

1. Prepare the updated rate list CSV file
2. Remove the out-of-date "Carrier Rates File", then all the rates related to this LCR carrier will be removed from internal database
3. Upload the new CSV file