# The ABCs of LCR (Least Cost Routing)

Before the advent of unlimited voice plans, consumers paid a premium for domestic long-distance calls. Today, they're more likely to pay a premium only for international long-distance, and even then many calling plans include "free" long-distance service to neighboring countries. For communications service providers (CSPs) who offer these plans, however, long-distance isn't free; they must continue to pay charges to third-party interconnect carriers and regional carriers to complete long-distance calls for their customers using those carriers' networks. To keep these long-distance carrier costs to a minimum, service providers rely on a process known as Least Cost Routing (LCR).
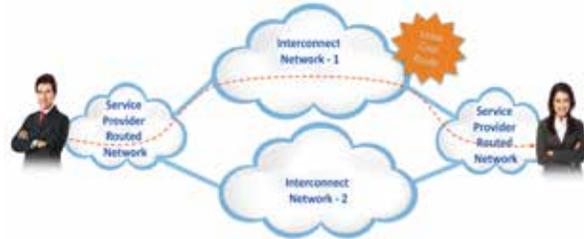
To understand how LCR can reduce long-distance costs, let's look at a voice call from Boston to London. To be completed, the call would need to travel over at least three networks: the originating CSP's network (a part of the call that would technically be free, since it would only cost the CSP bandwidth), the regional carrier's network in London, and the interconnect carrier whose network spans from Boston to London. Both the regional and interconnect carriers would charge the originating CSP a fee for using their networks; typically a fraction of a penny per minute. While that might seem like a small sum, service providers may route millions of long-distance calls every day, adding up to millions of dollars each month in long-distance carrier fees. Fortunately for service providers, the carrier market is a competitive one, and service providers may have multiple choices of which interconnect and regional carrier they use to complete these calls. And that's where Least Cost Routing comes into play.

While the principles of LCR seem simple enough (i.e., pick the route with the lowest price), the decision itself can be quite complex. Interconnect and regional carrier fees can change on a weekly or daily basis, in many ways mirroring a complex commodities market. In addition, competing interconnect carriers may offer a sliding rate per minute based on a volume discount, length of contract, time of day or other considerations. As a result, the same long-distance call may have a different least cost route from week to week, day to day or even hour to hour. Obviously, it's not practical for service providers to make a unique routing decision for each call based on the variables of the moment, unless those variables can be analyzed in milliseconds using automated, rules-based analytics—and that's essentially what an LCR solution does. LCR solutions apply a powerful analytics engine to analyze updated pricing information from hundreds of carriers around the world across multiple variables to determine the least cost route for each long-distance call. Once selected, the least cost route is then passed on to the network's routing engine—for VoIP networks, typically a softswitch or session border controller—where it determines the network path the call will take.

While price is the main consideration of LCR-based analysis, it's not the only consideration. LCR solutions also need to take into account the call quality, especially where service providers are bound by Service Level Agreements (SLAs) with their customers. This means understanding what kind of voice codecs are supported on a particular network route, as well as the reliability and bandwidth availability of that route at a particular point in time. LCR solutions also need to account for complicating factors such as number portability, which has allowed consumers to change the location of their phones without changing their area codes. For example, a phone with a ported number may have a London area code but actually reside in Birmingham, so the LCR decision would need to be based on the actual destination (Birmingham) rather than the area code itself (London)— information that resides only in a special number portability database.

5 Must-Have Features for Least Cost Routing

Shopping for an LCR solution to reduce OPEX costs in your network? To get the maximum cost benefit from LCR, look for a solution that supports these features:

- Centralized network routing
- Open APIs to billing and business apps
- Customized reporting
- Robust policy management
- Quality of Service (QoS) feedback mechanism

Policy, Routing and LCR

There are a number of vendors today who offer LCR solutions, although these solutions can vary significantly in terms of functionality and complexity. For example, some LCR solutions can aggregate and analyze information from a variety of sources including carrier price schedules, back-end billing systems and call detail records to determine least cost routes with more accuracy. Other LCR solutions can weigh additional considerations such as whether the call is over a fixed network or a (typically more expensive) mobile network. In general, LCR solutions should perform the following actions:

- Select the least cost route for all destinations
- Select the next cheapest route in the event of an overloaded/ unavailable route
- Factor in call quality to route selection
- Interface with back-end billing systems and number portability databases

While the LCR solution is an important consideration, service providers should also make sure that their network's policy and routing solution integrates well with the LCR-generated data, since the two solutions are complementary to one another. When building a policy, routing and LCR solution, service providers should look for these features:

Centralized Routing

A centralized routing and policy server can greatly reduce the provisioning of least cost routes by managing all of the updates to softswitches and Session Border Controllers (SBCs) from a single, central database. This approach is even more effective when a single, centralized routing and policy server can support multivendor, legacy switches and SBCs.

Open APIs

LCR solutions that support open APIs can import routing and pricing information from various systems as well as export LCR information to billing systems and other business applications.

Customized Reports

Choose an LCR solution that can generate customized reports such as customer rate sheets. This is especially important for wholesale carriers that need to provide accurate, updated pricing information to their customers on a regular basis.

Robust Policy Management

While lowest cost is an important factor in determining the ideal route, it isn't the only factor. Look for a policy and routing server that supports sophisticated routing considerations including temporary overloads, call types, time of day/week, emergencies, etc.

Feedback Mechanism

Choose an LCR solution that not only has the capability to continuously monitor Quality of Service (QoS), but also feeds that information back into the LCR system to make better routing decisions.

Conclusion

Choosing the right LCR solution is a decision that can save service providers millions of dollars. In addition to choosing an LCR engine that provides complex analyses of multiple levels of data, service providers should choose an LCR solution that integrates easily and effectively with their existing network routing and policy system. Without tight integration between the LCR engine and the routing engine, LCR calculations can become prohibitively complex and prevent service providers from realizing the true cost benefits of an LCR solution. To get the most value from an LCR solution, service providers may wish to consider an integrated LCR/routing solution that includes a Sonus Centralized Policy Server and a powerful LCR and policy/routing solution in a single, proven platform.

Sonus Networks North American Headquarters

4 Technology Park Drive
Westford, MA 01886
U.S.A.
Tel: +1-855-GO-SONUS

Sonus Networks APAC Headquarters

1 Fullerton Road #02-01
One Fullerton
Singapore 049213
Singapore
Tel: +65 6832 5589

Sonus Networks EMEA Headquarters

56 Kingston Road
Staines, Middlesex TW18 4NL
United Kingdom
Tel: +44-0-17-8422-5750

Sonus Networks CALA Headquarters

Mexico City, Campos
Eliseos Polanco
Andrés Bello 10, Pisos
6 y 7, Torre Forum
Col. Chapultepec Morales,
Ciudad de México
Mexico City, 11560 Mexico
Tel: +52 55 36010600

To learn more, call your Sonus sales representative or visit us online at www.sonus.net

Microsoft Partner
Gold Communications

Voice
Unified Communications
Business Productivity Solutions
Midmarket Solution Provider

Sonus®