

How call setup influences best cost algorithm

Applies to VoipNow 3 and higher!

This article explains how to use the best cost algorithm to route outgoing calls based on the available channels and the charged cost.

Default best route algorithm

The `Best Cost Routing Rules` are used to route the call using the best cost available. The server finds all the channels with costs for the target number (including free channels), selects the best matches from each channel, and in the end orders the channels starting with the "lowest cost first". It takes the first channel in the list and uses it to connect the outgoing call. If the route fails, then the application will take the next lowest cost channel available, so on and so forth, moving upwards to more expensive channels.

Use case

Let us take for example the following rule:

`Routing Rule 1` set up for number **12**. routing the call through the `Best Cost` rule.

There are four channels defined in the system:

1. Channel #1, with costs: **0.01 USD** per second for calls to **123**.
2. Channel #2, with only one cost: **0.02 USD** per second for calls to **12**.
3. Channel #3, which is free of charge.
4. Channel #4, with only one cost: **0.04 USD** per second for calls to **22**.

If an extension dials **12345**:

1. `Routing Rule 1` applies. All the available enabled channels are inspected. The server selects all channels with costs defined for number **12345**.
2. The following channels are found, ordered by cost: **Channel #3**, **Channel #1** and **Channel #2**.
3. The call is routed through **Channel #3**. This is the first channel because it is the free one.
4. If the call fails and the failure reason is rejection, the call is re-routed through **Channel #1**. Next, the cost of area code **1234** is selected because it represents the best match on this channel.
5. If the call fails and the failure reason is rejection, the call is re-routed through **Channel #2**.
6. If the call fails again, then `Routing Rule 1` ends here.

How to get the best cost route

The setup cost can influence the choice of the best cost route only if the parameter **Average call duration** was set in **System preferences >> Charging** tab.

For example, let us assume that we have two channels with the following call costs:

- **Channel #1**

Charge 0.1 USD/60 seconds with a setup cost of 1 USD

- **Channel #2**

Charge 0.9 USD/60 seconds with a setup cost of 0.2 USD

The server finds all the channels with costs for the target number (including free channels), selects the best matches from each channel, and in the end orders the channels, considering the most cost-effective alternative to route the call by means of the following formula:

$$\min((\text{setup_cost}/\text{average_call} * \text{charging_interval} + \text{call_cost}) / \text{charging_interval} * \text{average_call})$$

For example, if the **average_call** duration is **180** seconds, the results are:

- **Channel #1**

$$(1 \text{ USD} / 180 \text{ s} * 60 \text{ s} + 0.1 \text{ USD}) / 60 \text{ s} * 180 \text{ s} = (0.33 + 0.1) * 3 = 1.3 \text{ USD}$$

- **Channel #2**

$$(0.2 \text{ USD} / 180 \text{ s} * 60 \text{ s} + 0.9 \text{ USD}) / 60 \text{ s} * 180 \text{ s} = (0.3 + 0.2) * 3 = 1.5 \text{ USD}$$

In conclusion, even if the setup fee is bigger, the cost of an average length call is smaller via **Channel #1**. VoipNow Professional normally routes average and longer length calls using the channel with the best cost.

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