CLAIMS

[Claim 1] A method of monitoring and optimising voice call quality, the method comprising:

performing monitoring of a plurality of voice calls associated with a plurality of media addresses, including:

acquiring a call record of each target voice call of the voice calls, wherein the call record includes a call quality score, an abnormal data packet information, and a target media address which corresponds to the each target voice call, wherein the media addresses include the target media address;

based on the call quality score, and the abnormal data packet information, ascertaining a status type information of the target media address;

based on the ascertained status type information of the media address, ascertaining a call routing status for the media address; and

selecting, from the media addresses, a particular media address for an outbound voice call based on a corresponding call routing status of the particular media address,

wherein the step of based on the call quality score, and the abnormal data packet information, ascertaining the status type information of the media address includes:

based on the call quality score being less than a network anomaly threshold, ascertaining the status type information of the target media address as a network anomaly;

wherein based on the call quality score being equal to or higher than the network anomaly threshold, performing:

based on a count of abnormal data packets during a plurality of voice periods, a count of abnormal data packet time points during a call period, and a total count of abnormal data packets during the call period, ascertaining a proportion of abnormal data packets during the voice periods, wherein the call period comprises the voice periods and a plurality of non-voice periods;

based on the total count of abnormal data packets during the call period and a total count of data packets during the call period, ascertaining a proportion of abnormal data packets during the call period; and

based on the proportion of abnormal data packets during the voice periods and the proportion of abnormal data packets during the call period, ascertaining the status type information of the target media address; and

wherein based on the call quality score being equal to or higher than the network anomaly threshold and within a predetermined borderline range of the network anomaly threshold, the proportion of abnormal data packets during the voice periods being higher than a proportion of abnormal data packets during the non-voice periods by a predetermined margin,

ascertaining the status type information of the target media address as business-type fluctuation anomaly.

[Claim 2] The method of claim 1, wherein the step of based on the proportion of abnormal data packets during the voice periods and the proportion of abnormal data packets during the call period, ascertaining the status type information of the target media address includes:

based on the proportion of abnormal data packets during the voice periods being greater than or equal to an abnormality threshold for voice data packets and the proportion of abnormal data packets during the call period being greater than or equal to a business abnormality threshold, ascertaining the status type information of the target media address as business-type fluctuation anomaly;

based on the proportion of abnormal data packets during the voice periods being greater than or equal to the abnormality threshold for voice data packets and the proportion of abnormal data packets during the call period being less than the business abnormality threshold, ascertaining the status type information of the target media address as normal state;

based on the proportion of abnormal data packets during the voice periods being less than the abnormality threshold for voice data packets and the proportion of abnormal data packets during the call period being greater than or equal to the business abnormality threshold, ascertaining the status type information of the target media address as network-type fluctuation anomaly; and

based on the proportion of abnormal data packets during the voice periods being less than the abnormality threshold for voice data packets and the proportion of abnormal data packets during the call period being less than the business abnormality threshold, ascertaining the status type information of the target media address as normal state.

[Claim 3] The method of claim 1 or claim 2, wherein the step of based on the ascertained status type information of the media address, ascertaining a call routing status for the media address includes:

ascertaining a plurality of voice call counts during a predetermined time period which are respectively associated with the media addresses;

ascertaining at least a first one of the voice call counts as exceeding a predetermined monitoring threshold, wherein the at least first one of the voice call counts corresponds to at least a first one of the media addresses;

ascertaining, with respect to the first one of the media addresses, a plurality of occurrence counts corresponding to a plurality of status type information during the predetermined time period;

based on the occurrence counts, updating a routing control status of the first one of the media addresses.

[Claim 4] The method of claim 3, wherein the occurrence counts corresponding to status type information during the predetermined time period includes a first occurrence count corresponding to network anomaly or business-type fluctuation or network-type fluctuation, wherein the step of based on the occurrence counts, updating a routing control status of the first one of the media addresses includes:

based on the first occurrence count and a total count of the occurrence counts corresponding to network anomaly or business-type fluctuation or network-type fluctuation, ascertaining a proportion of the first occurrence count during the predetermined time period;

based on the proportion of the first occurrence count being greater than a first predetermined proportion threshold corresponding to network anomaly or business-type fluctuation or network-type fluctuation, generating an alarm message and stopping or disallowing call routing to the first one of the media addresses.

[Claim 5] The method of any one of claim 1 to claim 4, wherein prior to acquiring the call record of each target voice call of the voice calls**,** the method further comprising:

storing call data of the voice calls; and

generating the call record of the each target voice call.

[Claim 6] A non-transitory computer-readable medium comprising computer-executable instructions configured to direct at least one computer processor to perform the method according to any one of claim 1 to claim 5.

[Claim 7] An outbound voice calling system configured to monitor and optimise voice call quality, the system comprising:

at least one memory for storing computer-executable instructions; and

at least one processor communicably coupled to the at least one memory, and configured to:

execute the computer-executable instructions to perform the method according to any one of claim 1 to claim 5.

[Claim 8] An outbound voice calling system configured to monitor and optimise voice call quality, the system comprising:

a monitoring module which is configured to:

perform monitoring of a plurality of voice calls associated with a plurality of media addresses, including:

acquire a call record of each target voice call of the voice calls, wherein the call record includes a call quality score, an abnormal data packet information, and a target media address which corresponds to the each target voice call, wherein the media addresses include the target media address;

based on the call quality score, and the abnormal data packet information, ascertain a status type information of the target media address;

based on the ascertained status type information of the media address, ascertain a call routing status for the media address; and

a soft switch communicably coupled to the monitoring module and configured to:

select, from the media addresses, a particular media address for an outbound voice call based on a corresponding call routing status of the particular media address;

wherein the monitoring module is further configured to:

based on the call quality score being less than a network anomaly threshold, ascertain the status type information of the target media address as a network anomaly;

wherein the monitoring module is further configured to:

based on the call quality score being equal to or higher than the network anomaly threshold, perform the following steps:

based on a count of abnormal data packets during a plurality of voice periods, a count of abnormal data packet time points during a call period, and a total count of abnormal data packets during the call period, ascertain a proportion of abnormal data packets during the voice periods, wherein the call period comprises the voice periods and a plurality of non-voice periods;

based on the total count of abnormal data packets during the call period and a total count of data packets during the call period, ascertain a proportion of abnormal data packets during the call period; and

based on the proportion of abnormal data packets during the voice periods and the proportion of abnormal data packets during the call period, ascertain the status type information of the target media address; and

wherein the monitoring module is further configured to:

based on the call quality score being equal to or higher than the network anomaly threshold and within a predetermined borderline range of the network anomaly threshold, the proportion of abnormal data packets during the voice periods being higher than a proportion of abnormal data packets during the non-voice periods by a predetermined margin, ascertain the status type information of the target media address as business-type fluctuation anomaly.

[Claim 9] The system of claim 8, wherein the monitoring module is further configured to:

based on the proportion of abnormal data packets during the voice periods being greater than or equal to an abnormality threshold for voice data packets and the proportion of abnormal data packets during the call period being greater than or equal to a business abnormality threshold, ascertain the status type information of the target media address as business-type fluctuation anomaly;

based on the proportion of abnormal data packets during the voice periods being greater than or equal to the abnormality threshold for voice data packets and the proportion of abnormal data packets during the call period being less than the business abnormality threshold, ascertain the status type information of the target media address as normal state;

based on the proportion of abnormal data packets during the voice periods being less than the abnormality threshold for voice data packets and the proportion of abnormal data packets during the call period being greater than or equal to the business abnormality threshold, ascertain the status type information of the target media address as network-type fluctuation anomaly; and

based on the proportion of abnormal data packets during the voice periods being less than the abnormality threshold for voice data packets and the proportion of abnormal data packets during the call period being less than the business abnormality threshold, ascertain the status type information of the target media address as normal state.

[Claim 10] The system of claim 8 or claim 9, wherein the monitoring module is further configured to:

ascertain a plurality of voice call counts during a predetermined time period which are respectively associated with the media addresses;

ascertain at least a first one of the voice call counts as exceeding a predetermined monitoring threshold, wherein the at least first one of the voice call counts corresponds to at least a first one of the media addresses;

ascertain, with respect to the first one of the media addresses, a plurality of occurrence counts corresponding to a plurality of status type information during the predetermined time period;

wherein the soft switch is further configured to:

based on the occurrence counts, updating a routing control status of the first one of the media addresses.

[Claim 11] The system of claim 10, wherein the monitoring module is further configured to:

based on the first occurrence count and a total count of the occurrence counts corresponding to network anomaly or business-type fluctuation or network-type fluctuation, ascertain a proportion of the first occurrence count during the predetermined time period;

based on the proportion of the first occurrence count being greater than a first predetermined proportion threshold corresponding to network anomaly or business-type fluctuation or network-type fluctuation, generate an alarm message;

wherein the soft switch is further configured to:

based on the alarm message, stop or disallow call routing to the first one of the media addresses.

[Claim 12] The system of claim 8 to claim 11, wherein the soft switch is further configured to: store call data of the voice calls, wherein the monitoring module is further configured to: generate the call record of the each target voice call.