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Dynamic determination of RCS video share capability

ABSTRACT

Mobile video calling requires determination of whether the available network is capable of supporting video calls. In Rich Communication Suite (RCS), such determination is static and is made at the time of call initiation. Such an approach limits usefulness of video share call functionality, e.g., when network conditions change during a call.

This disclosure describes techniques to determine at regular intervals whether an available network at a user location or cell site supports video calling. A network performance database is queried periodically to determine whether the network at a user's location supports video calling. If video calling is supported, the video share feature is made available, prior to or during a call. When users provide consent, an update of the video share call feature status for a particular user is provided to the user's contacts. The status of video share feature is dynamically changed based on changes in the available network conditions. The encoding rate for a codec used for the video call is determined based on the network conditions. The techniques can also be used to dynamically determine whether other enhanced calling features that are dependent on network quality are supported by the available network at a user location.

KEYWORDS

- video chat
- video share
- RCS
- cellular coverage area
- enhanced calling

BACKGROUND

Rich Communication Suite (RCS) is the successor to SMS (Short Message Service) and MMS (Multimedia Messaging Service) technologies. This technology includes rich chat features found in OTT (Over-The-Top) messaging applications and enhanced calling features that enable users to share different types of content when originating a call. An important RCS enhanced calling feature is the ability to initiate a video share call, e.g., a video call/chat.

Currently, video share call feature is enabled based on the radio access network available when the call is initiated, e.g., based on the location and time of call initiation. If the call is initiated when available bandwidth is relatively low (e.g., the available network is an EDGE network), the video share call feature is disabled, e.g., the icon for video calling is not presented in the UI or is greyed out. The feature is also disabled for other users on the call since the video call is not supported due to the low bandwidth available to the calling user and consequent inability to transmit video. For example, the availability of video share is indicated in a table that includes a VSAuth value that is mapped to available radio technology, e.g., 3G, HSPA, LTE, Wi-Fi, etc. The particular bits of the VSAuth value that correspond to the available network are set to indicate whether video share is enabled for the particular type of network.

The bandwidth check has a static nature of this bandwidth check, such that it is performed infrequently. Therefore, an improvement in the calling user's network quality does not update the status of the video share call feature. For instance, when users originate a call in a low bandwidth area and subsequently move to an area with higher bandwidth availability, the video share call feature is not made available on the user device.

Alternatively, a network terminal conducts its own network quality tests (e.g., peak throughput and current packet delay tests) during the origination of a voice call. The issue of

static configuration persists in this configuration. Another disadvantage of terminal network

quality tests is that such tests are slow and may not have the network quality information readily

available when a user wants to originate a video call or during an ongoing call.

DESCRIPTION
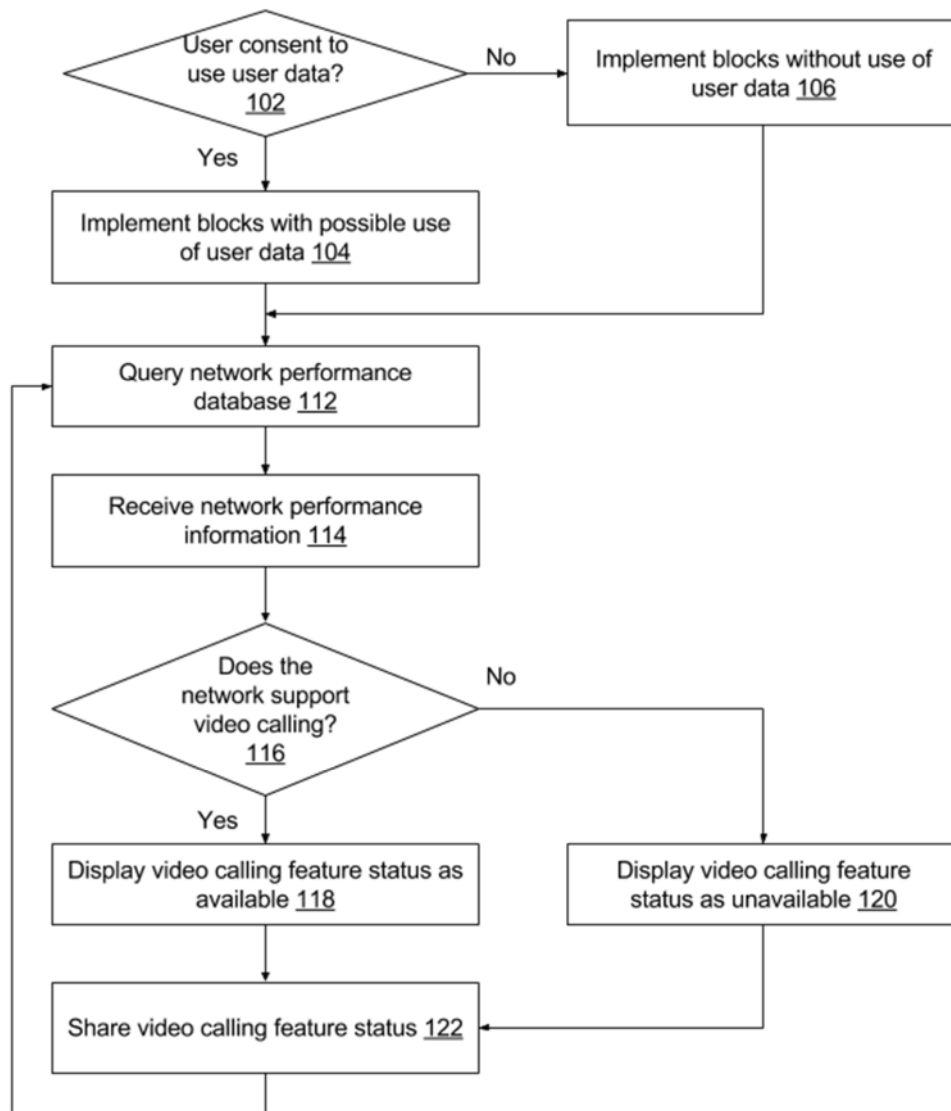
Fig. 1: Determining if a network cell site supports video calling

When the caller and other participants in a call provide consent, the techniques described herein dynamically determine, at predetermined intervals, whether the network available to each participant in a call is of a quality sufficient to support video calling. Based on the network performance, the availability status of the video share call feature on the user equipment ("UE") of the participants in the call is updated. Sic determination can be made before a call is made, during call initiation, and at any time during an ongoing call. User equipment includes mobile devices such as cell phones, smart phones, wearables and tablets, as well as other devices that support voice and video calling via RCS.

Fig. 1 illustrates a method to determine whether a network cell site supports video calling. It is determined whether the user has consented to use of user data (102), e.g., location. If the user consents to use of user data, the method is implemented with possible use of such data (104), else, the method is implemented without use of user data (106).

Network information corresponding to the UE location or cell site is queried from a network performance database (112). The network performance database can provide access to, information that enables determination of whether a particular network supports video calling at a specific user location or network cell. Further, when a user consents to use of user location data, the performance of surrounding network locations or cell sites along a path are queried in anticipation of the user's movement along the path.

The information received (114) from the network performance database for a given user location or network cell can include data pertaining to all relevant access networks, including cellular and Wi-Fi. Based on the received information (such as network quality, current peak throughput and current packet delay), a determination (116) is made as to whether the current network is suitable for video calling.

If the network is suitable for video calling (118), the video share feature is enabled for the user and the appropriate video share feature tag is updated to show availability. The user is alerted of video share call availability, e.g., by display of an icon corresponding to the video calling feature as active. Alternatively, if the network is not suitable for video calling (120), the video share feature is disabled by removing the video share feature tag, if such tag is present. In this case, referring to the above example, the video calling icon is inactive (e.g., greyed out) to indicate unavailability of the video calling feature.

When the user permits, the availability of the video share call feature is communicated to the user's contacts (122). Dynamically determination of the feasibility of video calling and providing corresponding indicators can help improve the likelihood that the user accesses and uses the feature.

The described techniques use a video codec to determine a suitable coding rate to use during a video share call. For example, the network performance database can provide an indication of suitable rates. During any mobility event, such as handover to a new network cell site or to/from Wi-Fi, if the available network quality of service changes, a query is sent to the network performance database. If the mobility event occurs during a video share call, a query is sent to retrieve the information required to tune the current encoding rates used by the codec.

For example, the encoding rate is reduced if the network quality degrades and increased if the network quality improves. By proactively determining network quality and using heuristics, appropriate encoding rates are used to improve the quality of a video call. Such data can also help determine reasons for a dropped video share call, e.g., due to network performance degradation, and enable provision of real-time feedback to users.

The present techniques can be used by any device or application to determine suitability of the available network for a particular service such as video calls. For instance, a mobile phone application can determine whether a network at a particular cell site supports a specific feature that depends on network quality. These techniques can be implemented with GSMA RCS standards or Open Mobile Alliance (OMA) standards.

In situations in which certain implementations discussed herein may collect or use personal information about users (e.g., user data, information about a user's social network, user's location and time at the location, user's biometric information, user's activities and demographic information), users are provided with one or more opportunities to control whether information is collected, whether the personal information is stored, whether the personal information is used, and how the information is collected about the user, stored and used. That is, the techniques discussed herein collect, store and/or use user personal information specifically upon receiving explicit authorization from the relevant users to do so.

For example, a user is provided with control over whether programs or features collect user information about that particular user or other users relevant to the program or feature. Each user for which personal information is to be collected is presented with one or more options to allow control over the information collection relevant to that user, to provide permission or authorization as to whether the information is collected and as to which portions of the information are to be collected. For example, users can be provided with one or more such control options over a communication network. In addition, certain data may be treated in one or more ways before it is stored or used so that personally identifiable information is removed. As one example, a user's identity may be treated so that no personally identifiable information can

be determined. As another example, a user's geographic location may be generalized to a larger region so that the user's particular location cannot be determined.

CONCLUSION

This disclosure describes techniques to determine at regular intervals whether an available network at a user location or cell site supports video calling. A network performance database is queried periodically to determine whether the network at a user's location supports video calling. If video calling is supported, the video share feature is made available, prior to or during a call. When users provide consent, an update of the video share call feature status for a particular user is provided to the user's contacts. The status of video share feature is dynamically changed based on changes in the available network conditions. The encoding rate for a codec used for the video call is determined based on the network conditions. The techniques can also be used to dynamically determine whether other enhanced calling features that are dependent on network quality are supported by the available network at a user location.