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Adjustable Aggressive Pre-Buffer Amount Based On User Location

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ADJUSTABLE AGGRESSIVE PRE-BUFFER AMOUNT BASED ON USER LOCATION

ABSTRACT

A system and method for aggressively pre-buffering media content on a device is disclosed. The system includes a mobile computing device installed with an application (app) for accessing a digital distribution platform through a network connection. The app is in communication with a server including a user database. The method includes providing instructions for choosing when to aggressively pre-buffer media content by classifying the likelihood the user will change to a lower quality connection. This likelihood is determined based on the past median connection duration of other users on the same connection. The disclosed system and method reduce the total bandwidth cost required to ensure most users have an appropriate amount of content pre-buffered on their local device. Further, it reduces battery consumption by only aggressively streaming the content when the user is likely to change to a lower quality connection.

BACKGROUND

Music is a popular use case for digital distribution platforms, such as video hosting services with music content. A lot of people listen to music on the go using such services. In areas where there is no network, a loss of playback may result in a bad user experience. For instance, if the user is driving in remote areas with poor network coverage resulting in a loss of playback, the user is unable to do anything about it.

DESCRIPTION

A system and method for aggressively pre-buffering media content on a device based on the user location and categorization of network connection is provided herein. The system is depicted in FIG. 1 and includes a mobile computing device installed with an application (app)

for accessing a digital distribution platform through a network connection. The app is in communication with a server including a user database. The digital distribution platform may be a video hosting service with music content, such as a music video. The network connection may be a WiFi or a non-WiFi connection, such as a long range wireless network. The app is enabled to capture data of geo-location and cell tower used to connect the mobile computing device when operating without a WiFi connection.

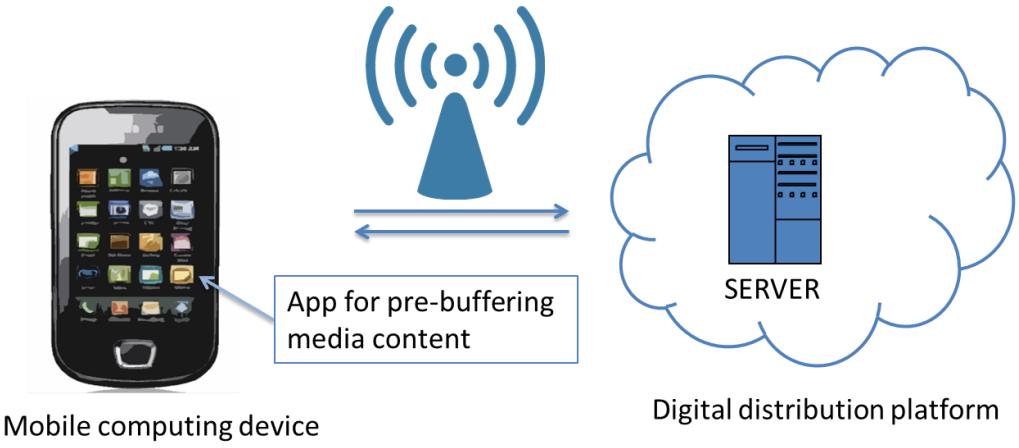

FIG. 1: A system for aggressively pre-buffering media content on a device.

The method is depicted in FIG. 2 and includes providing instructions for choosing when to aggressively pre-buffer significant amounts of media content on a user's device based on the user location and categorization of the network connection. The network connection is uniquely identified based on either geo-location of the mobile computing device or a WiFi network and assigned a canonical identifier. In the case of non-WiFi connections, the geo-location is bundled into the canonical identifier. The connection is then classified based on the likelihood that the user will leave that particular connection for either a no connection state or a weaker connection. This likelihood is determined based on the past median connection duration of other users on the same connection. Alternatively, the user's internet speed may be additionally monitored to determine if the user is more likely to move from one connection to another.

In one instance, predefined criteria may be utilized to determine whether or not to buffer large amounts of content for a particular user on a flagged network connection. These include: user's current session length, the median session length of other users on the same network as well as the median deviation of users on that network, and the median and median deviation of the total session length for users whose part of the session is on that network. By comparing the delta between the user's current session length and the median session length on the session against the median deviation of the session we may determine the likelihood that the user will remain on that network for a specific period of time in the future. This may be combined with the median total session length and median deviation to determine how much more time is likely left in the user session.

If the network is classified as a candidate for aggressive pre-buffering, and the user is likely to continue a long session on a different internet connection soon, then the system may aggressively pre-buffer content on the user device. Alternatively, simply connecting to a network flagged for aggressive buffering will cause the app to aggressively buffer the content. Pre-buffering a video is extremely expensive and could turn out wasteful, if the user does not actually consume the content. Therefore, a right balance between no pre-buffering and pre-buffering everything aggressively is determined.

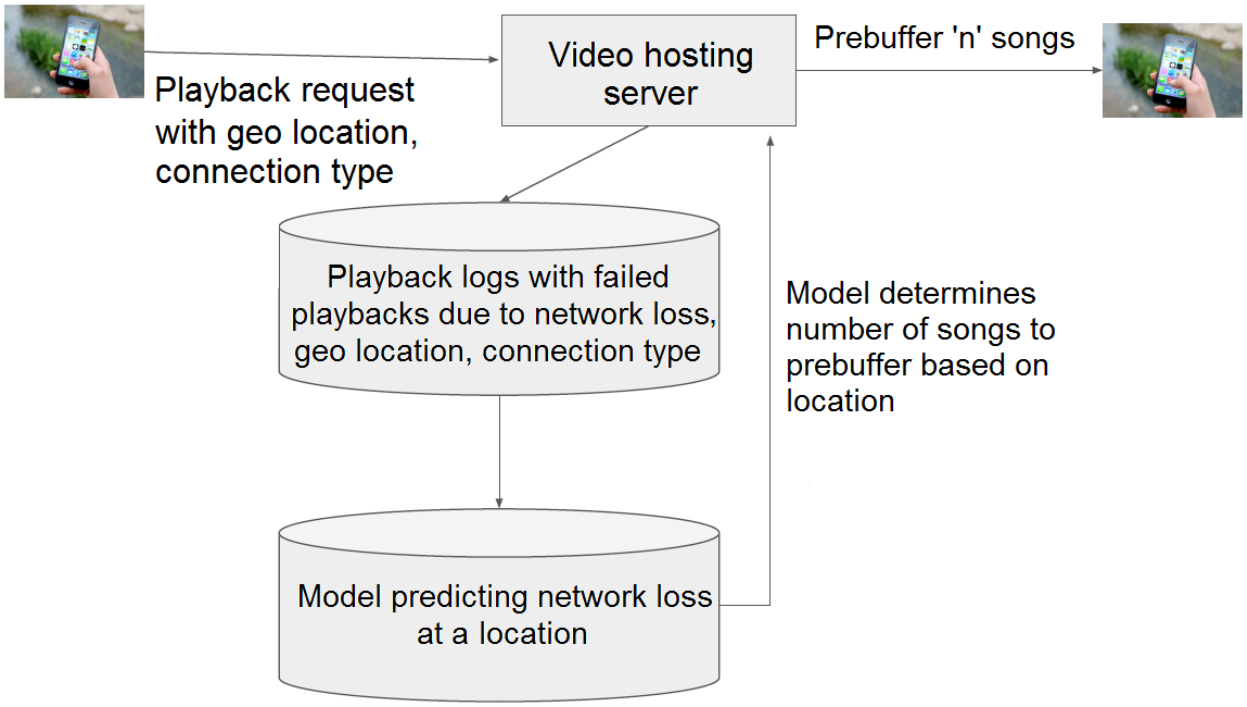

FIG. 2: A method for aggressively pre-buffering media content on a device

The system may determine at-risk users using their cell tower or network location and pre-buffer a bunch of songs ahead of time. For example, if the user is near Yosemite National Park and it is known that if the user goes 1 mile to the East, the network connection will be lost. In this case, the next couple of songs may be aggressively pre-buffered. However, if the user is at home on WiFi or in a metro area and is not likely to lose connection, no aggressive pre-buffering is done.

The disclosed system and method reduce the total bandwidth cost required to ensure most users have an appropriate amount of content pre-buffered on their local device. This improves on existing adaptive bitrate technology by not only adjusting based on the quality of the internet connection at the current location, but also based on that at the user's future location. The selective streaming only when determined as necessary reduces battery consumption, which is valuable to users.