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ABSTRACT

When users are employing a meeting within an online communication and collaboration facility (which brings together capabilities such as video conferencing, online meetings, screen sharing, webinars, Web conferencing, and calling), the process of migrating the meeting from a personal computer (PC) to a mobile device is frequently difficult and may even be annoying. For example, a user may need to repeat the complete meeting process (such as entering a password, confirming a disclaimer, etc.) and their account and meeting status may also be lost during the process. To address the type of challenge that was described above, techniques are presented herein that provide a complete process to solve users' pain points. Aspects of the presented techniques support an automatic, fast, seamless, and secure feature which may be referred to as "move meeting." Further aspects of the presented techniques offer a user experience comprising two parts (a PC side and a mobile side), leverage a quick response (QR) code, incorporate a backend system, and employ application programming interface (API) calls.

DETAILED DESCRIPTION

As an initial matter, it will be helpful to confirm a point of nomenclature. Elements of the discussion that is presented below make reference to an online communication and collaboration facility. Such a facility, which for simplicity of exposition may be referred to herein as an online facility, brings together capabilities such as video conferencing, online meetings, screen sharing, webinars, Web conferencing, and calling.

When a user is employing an online facility, they often need to migrate a meeting from a personal computer (PC) to a mobile device so that they may continue the meeting

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when, for example, they leave their desktop environment. Generally speaking, a user will rejoin the meeting on the mobile side and leave the meeting on the PC side.

During such a process, a user may need to sign in on the mobile side, enter a meeting link and a password, and confirm a disclaimer. After a connection is established, they may also need to wait for a host to admit them, manually connect to the audio, and perform other activities. Additionally, there is also a need to leave the meeting on the PC side. All of the above-described tasks may be quite frustrating.

The process that was described above entails a number of challenges, including, for example, requiring a significant amount of user interaction, consuming a great deal of time, the possibility of lost user states (such as account information, meeting role, etc.), and potentially disturbing other attendees.

Techniques are presented herein that address the challenge that was described above. Aspects of the presented techniques leverage a quick response (QR) code.

While existing solutions may address elements of the above-described challenge, the presented techniques support a comprehensive process that includes, among other things, a method for encoding session data into an optically- and machine-readable representation of data (such as, for example, a QR code) that other multimedia endpoints may employ to establish a session.

Under aspects of the presented techniques, server clients may collaborate to overcome barriers such as entering passwords, confirming disclaimers, etc. Further, synchronization is supported between a PC and a mobile device to maintain conference role, audio status, etc. Additionally, scalable security policies are offered under which customers may prevent the migration process from taking place according to their needs.

In summary, the techniques presented herein support an application-level solution that integrates all of the above-described aspects to provide a complete user experience that solves user pain points.

Aspects of the techniques presented herein were delivered to customers as a formal feature in a product release from a major network equipment vendor. It is important to note that the feature was widely praised by that vendor's partners and customers as soon as it was released. Figure 1, below, presents elements of a first online exchange encompassing user feedback.
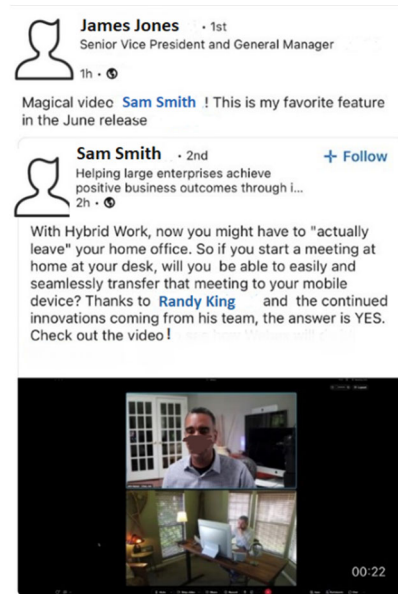
Figure 1: Illustrative User Feedback

Figure 2, below, depicts elements of a second online exchange encompassing additional user feedback.
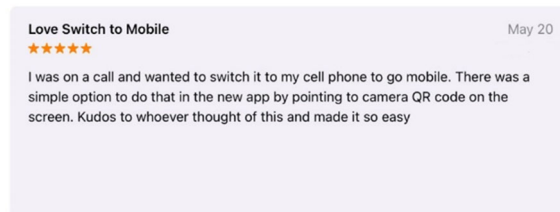

Figure 2: Illustrative User Feedback

As described above, when a user is employing an online facility they often need to migrate a meeting from a PC side to a mobile side when they leave their desktop. However, that process is frequently difficult and it may even be annoying.

Accordingly, techniques are presented herein that support an automatic, fast, seamless, and secure feature, which may be referred to herein as "move meeting," to address such a user pain point.

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Under the techniques presented herein, the user experience may comprise two parts – a PC side and a mobile side.

On the PC side, a new action item (which may be named "Move Meeting to Mobile") may be provided. When a user selects that action item, a QR code dialog may be displayed. Figure 3, below, depicts a PC-side screenshot that illustrates elements of such a process according to the techniques presented herein.
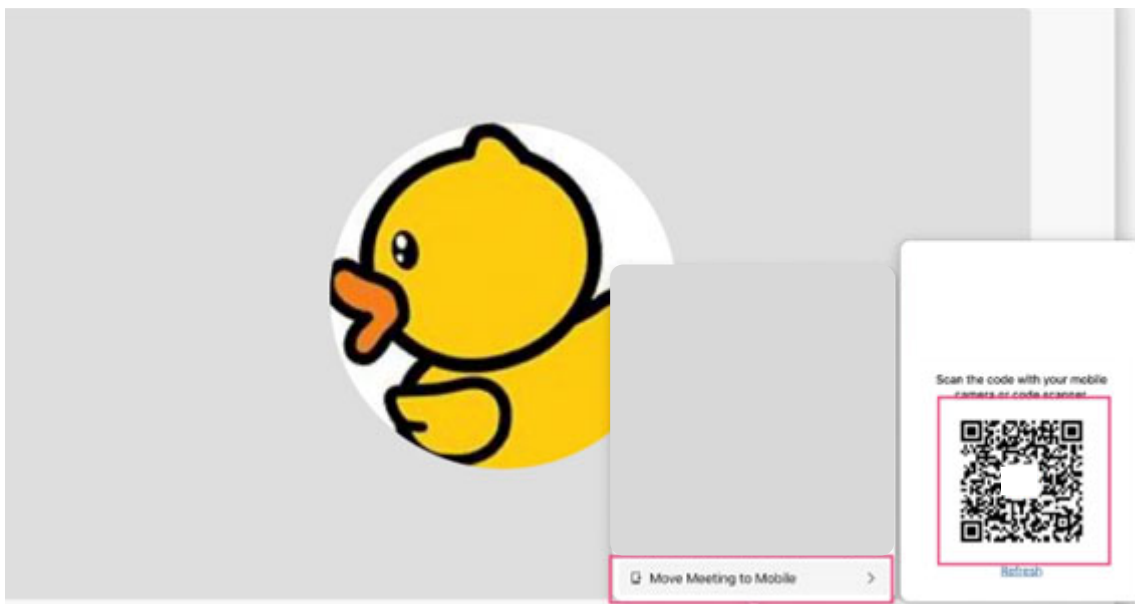

Figure 3: Exemplary PC-Side Move Meeting to Mobile Action Item

On the mobile side, a new action (which may be named "Scan QR code") may be provided. When a user selects that action, they may scan a QR code through their system's camera to initiate the move meeting process. Alternatively, a user may also directly employ a system's camera to perform a scan. After a very short wait, the mobile device will enter the meeting and automatically synchronize to the status of the PC. Figure 4, below, depicts a mobile-side screenshot that illustrates elements of such a mobile-side flow according to the techniques presented herein.
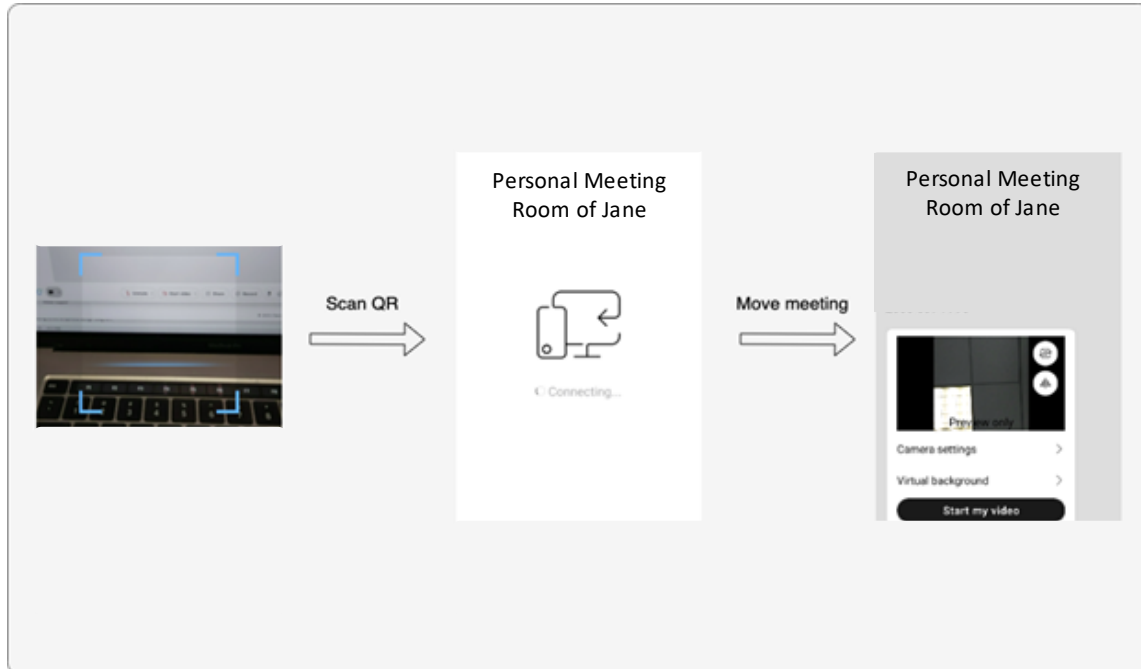
Figure 4: Exemplary Mobile-Side Move Meeting Flow

As the above-described activities are taking place, a PC may automatically leave a meeting.

The design of a "move meeting" feature, as described and illustrated above and according to the techniques presented herein, encompasses the cooperation of three parts – a mobile device, a PC, and a backend. Figure 5, below, presents elements of an overall design that is possible according to aspects of the presented techniques and that is reflective of the above discussion.
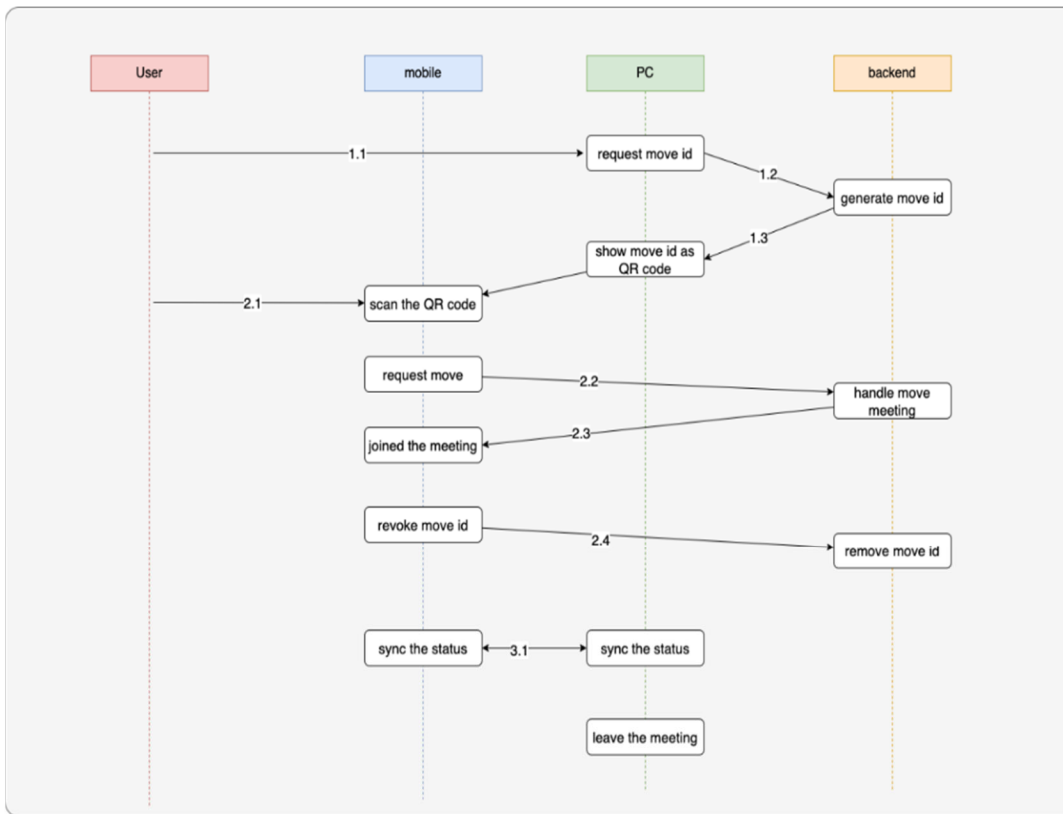
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Figure 5: Exemplary Move Meeting Design

The design that was illustrated in Figure 5, above, identifies a series of sub-steps that are labeled as 1.1 through 3.1 in the figure. Those sub-steps, which reside under the Steps 1 through 3, will be described during the next section of the instant narrative.

Step 1, which incorporates the sub-steps 1.1 through 1.3, encompasses the display on a PC side of a QR code for the moving of a meeting.

Under Step 1.1, a user selects a "Move Meeting to Mobile" action item. At Step 1.2, the PC issues a call to an application programming interface (API), that is provided by the backend, to request a "move id," which may be a universally unique identifier (UUID), as the move credential. Then, at Step 1.3, the PC receives a response from the API and displays the "move id" as a QR code.

Step 2, which incorporates the sub-steps 2.1 through 2.4, encompasses the joining of the meeting through the scanning of a QR code on a mobile side.

Under Step 2.1, the user scans the QR code on their mobile device. At Step 2.2, the mobile device parses the "move id" from the QR code and then uses it to call a backend

API to start the move process. Then, at Step 2.3, the mobile device receives a response from the API and joins the meeting.

There are two aspects of Steps 2.2 and 2.3 that will benefit from further explanation.

First, the backend guarantees that the response to a move meeting API call is the same as the previous meeting join that was completed by the PC. That is, from a meeting point of view the PC and the mobile are the same node. Consequently, a user's account information (such as name, avatar, etc.) will be maintained during the move process.

Second, the backend guarantees that all of the obstacles will be skipped. Consequently, during the migration process operations such as entering a password, confirming a disclaimer, and requesting that a host admit a user will be forgiven.

Under Step 2.4, for security when a mobile device joins the meeting a call may be made to the backend API to revoke the previously-issued "move id." Then, the backend may remove the "move id" so that the QR code will be discarded.

Step 3, which incorporates the sub-step 3.1, encompasses synchronizing the status between the mobile device and the PC.

Under sub-step 3.1, the state synchronization process starts automatically after the mobile device joins the meeting. First, the meeting role of the PC (such as host, presenter, etc.) is transferred to the mobile device. Then, the mobile device automatically performs different operations (such as connecting audio, muting, etc.) to remain consistent with the status of the PC.

Finally, the PC may automatically leave the meeting. At that point, the entire move meeting process is complete.

Aspects of the techniques presented herein support different security capabilities, which may comprise two parts – a mandatory policy and a customer-defined policy.

Under the mandatory policy, a QR code is disposable. As depicted in Figure 5, above, the backend provides an API call that may be used to revoke a previously-generated "move id." When a mobile device joins a meeting, that API call may be invoked to initiate such a revocation so that the QR code will become invalid.

Additionally, under the mandatory policy a QR code is time-sensitive. When a client successfully obtains a "move id" from a backend, a five minute timer is also started. Consequently, after a QR code has existed for more than five minutes it will become invalid.

For the customer-defined policy, under normal circumstances the move meeting process may occur between any two devices (such as a PC and a mobile device). However, some companies may have their own requirements. A company may want to customize the conditions that allow the moving of a meeting. For example, a customer may prohibit the moving of a meeting from a PC to a mobile device without the same account existing on both sides for their own sites. Consequently, aspects of the techniques presented herein may provide an interface that allows users to customize their own security policies.

As described and illustrated above, the techniques presented herein provide a perfect way to move a meeting from a PC to a mobile device. As such, those techniques offer a number of advantages.

First, the entire process is very easy to use. A user need only display a QR code on their PC and then scan it on a mobile device.

Second, the presented techniques are intelligent. During the whole process, any annoying operations (such as inputting a password, confirming a disclaimer, and waiting for a host to admit a user) will be skipped.

Third, the presented techniques are fast. Thanks to the simplified join process, the whole process is faster.

Fourth, the presented techniques are seamless. During the whole process, status particulars (such as username, user avatar, meeting role, and audio status) are maintained.

Fifth, in addition to mandatory security policies the presented techniques also provide custom security policies for a user.

In summary, techniques have been presented herein that provide a complete processes to solve users' pain points. Aspects of the presented techniques support an automatic, fast, seamless, and secure feature which may be referred to as "move meeting." Further aspects of the presented techniques offer a user experience comprising two parts (a PC side and a mobile side), leverage a QR code, incorporate a backend system, and employ API calls.