

# EXHIBIT 4

**Analysis of Infringement of U.S. Patent No. 6,574,239 by Capital One Financial Corporation  
(Based on Public Information Only)**

Communication Interface Technologies, LLC (“CIT”) provides this preliminary and exemplary infringement analysis of U.S. Patent No. 6,574,239, entitled *Virtual Connection of a Remote Unit to a Server* (“the ’239 patent”) by Capital One Financial Corporation (“Capital One”). The following chart illustrates an exemplary analysis regarding infringement by Capital One device application(s) including the Capital One Mobile App, the Capital One CreditWise App, Capital One T&Easy app, Capital One Mobile app, and the Capital One Mobile app for Apple Watch, along with any hardware and/or software for provisioning the application (collectively, the “Accused Instrumentalities”). Upon information and belief, the exemplary version herein and the Accused Instrumentalities distributed prior to expiration of the patents-in-suit operated materially in the same manner.

The analysis set forth below is based only upon information from publically available resources regarding the Accused Instrumentalities. Capital One has not yet provided any non-public information.

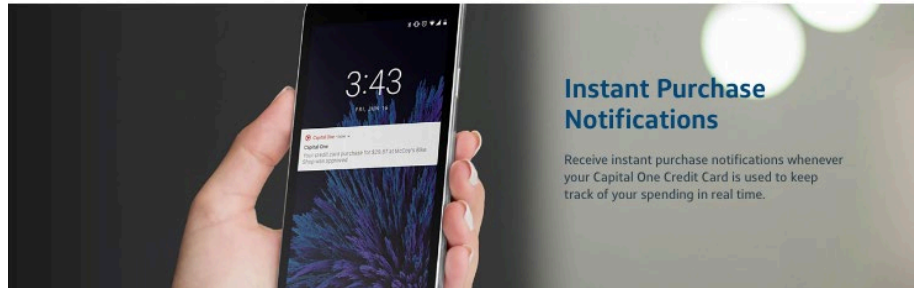
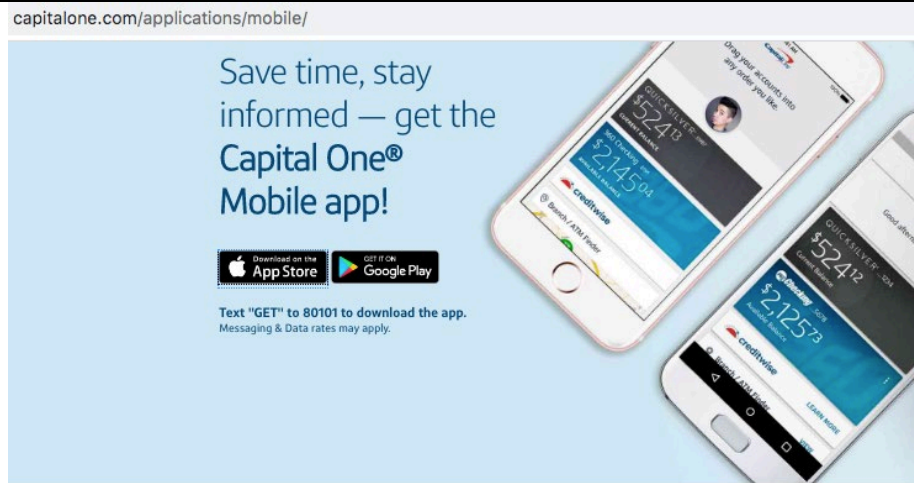
Unless otherwise noted, CIT contends that Capital One directly infringes the ’239 patent in violation of 35 U.S.C. § 271(a) by offering to sell, making, using, and/or importing the Accused Instrumentalities. The following exemplary analysis demonstrates how the Accused Instrumentalities infringe the ’239 patent.

Unless otherwise noted, CIT believes and contends that each element of each claim asserted herein is literally met by the provision of the Accused Instrumentalities. However, to the extent that Capital One attempts to allege that any asserted element is not met, CIT believes and contends that such elements are met under the doctrine of equivalents. More specifically, in its infringement analysis of the Accused Instrumentalities, CIT did not identify any substantial differences between the elements of the patent claims and the features of the Accused Instrumentalities, as set forth herein. In each instance, the identified feature of the Accused Instrumentality performs at least substantially the same function in substantially the same way to achieve substantially the same result as the corresponding element of the patent claim.

CIT notes that the present claim chart and analysis are necessarily preliminary in that CIT has not obtained substantial evidence of infringement. Capital One nor has Capital One disclosed any detailed analysis for its non-infringement position, if any. Further, CIT does not rely on claim construction or expert discovery. CIT reserves the right to supplement and/or amend the positions taken in this preliminary infringement analysis, including with respect to literal infringement and infringement under the doctrine of equivalents, further information obtained by CIT, including but not limited to information adduced through information exchanges between the parties, claim construction, expert discovery, and/or further analysis.

	<b>Claim 7</b>	<b>Capital One Mobile App Service</b>
7	For use in controlling a virtual session on a server, a method comprising:	A method is specified for controlling a virtual session on a server. The session is described section 7a below.
7a	establishing a virtual session with a remote unit, the virtual session being instantiated to support at least one application layer program;	<p>Wireless push notification messages are sent over Transport Layer Security (TLS) between the remote server and the client side application establish a separate TLS session for client-server communications. For example, a Capital One server establishes a separate Capital One application program (application layer program) running on a tablet (remote unit).</p> <p>TLS session use a full handshake sequence that is used to establish connection and an abbreviated handshake sequence that is used to resume the TLS session from a dormant state to an active state whereby new payload data can be sent over the connection again.</p> <p><i>See Endnote #2 for a discussion of the virtual session aspects of TLS.</i></p> <p><i>See Endnote #5 for a discussion of Wireless push email services such as Gmail that send wireless push notification packets from a Gmail server.</i></p> <p><i>See Endnote #2 for a discussion of how wireless push notification services use Transport Layer Security (TLS) connections that constitute virtual sessions implemented below the application layer.</i></p> <p>Mobile applications communicate with their application server via TLS connections. TLS connections are established at the time the app is installed or launched and are maintained over time using a session token. <i>See Endnote#2 for a discussion of TLS.</i></p> <p><a href="https://www.ibm.com/support/knowledgecenter/en/SSHS8R_8.0.0/com.ibm.zos.v2r1.ssl.enforce_TLS.html">https://www.ibm.com/support/knowledgecenter/en/SSHS8R_8.0.0/com.ibm.zos.v2r1.ssl.enforce_TLS.html</a></p> <p>“From iOS 9, Transport Layer Security (TLS) protocol version 1.2 must be used for all communications between the device and the server.”</p>

		<p>“Apple App Transport Security (ATS) is a new feature of iOS 9 that enforces secure connections between the app and the server. By default, this feature enforces requirements that improve security. These include client-side HTTPS requirements, certificates and connection ciphers that conform to Transport Layer Security (TLS) using forward secrecy.”</p> <p><i>See <a href="https://www.icir.org/johanna/papers/conext17android.pdf">https://www.icir.org/johanna/papers/conext17android.pdf</a> - Android secure connections between client app and server are ubiquitously used.</i></p> <p><i>See <a href="https://developer.android.com/training/articles/security-ssl">https://developer.android.com/training/articles/security-ssl</a> - “The Transport Layer Security (SSL)—now technically known as <u>Transport Layer Security (TLS)</u>—is the standard for encrypted communications between clients and servers.”</i></p> <p>The Capital One application and the Capital One server communicate over the network to provide secure communications between the client app and the server.</p> <p><i>See <a href="https://datatracker.ietf.org/doc/rfc5077/">https://datatracker.ietf.org/doc/rfc5077/</a> - Note that session resumption does not appear to have been available in SSL and earlier versions, especially prior to November of 1998.</i></p>
7b	placing the virtual session in an inactive state;	<i>See Endnote #2. Note when the application data phase is finished, the session enters the inactive state. Hence the end of application data marker is the signal to enter into the inactive state.</i>
7c	sending a signal indicative of an incoming communication request and an application-program identifying packet to said remote unit, said application-program identifying packet identifying an application program that needs to resume a virtual session and communicate with said remote unit; and	<p>Capital One server causes a push notification message (incoming communication) to be sent to the Capital One application running on the user’s smartphone or tablet device.</p> <p>In the Capital One application, for example, a push notification contains purchase notifications, etc.</p> <p><i>See <a href="https://www.capitalone.com/applications/mobile/">https://www.capitalone.com/applications/mobile/</a></i></p>



The Capital One server and the Capital One application will resume a T server and the remote unit can resume communications. To do so the a invoke a protocol stack within the remote unit to communicate back to unit.

See Endnote #1 and #2 for a discussion of how each new set of data pay Capital One application includes an app-specific device token. The ap indicative of the Capital One application running on the user's smartph incoming wireless Internet Protocol packet that contains the app-specif to an application-program identifying packet.

7d placing the virtual session back into the

The Capital One server sends a push notification message to the Capita

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