Before the
U.S. Copyright Office
Library of Congress

In the Matter of Exemption to Prohibition on
Circumvention of Copyright Protection
Systems for Access Control Technologies
Docket Number RM 2011–7

Comments of the New America Foundation's Open Technology Initiative

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In response to the Notice of Proposed Rulemaking Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies (NOPR),[1] The New America Foundation's Open Technology Initiative (OTI) submits the following comments and respectfully asks the Librarian of Congress to exempt the following classes of works from 17 U.S.C. § 1201(a)(1)'s prohibition on the circumvention of access control technologies for the period 2012-2015:

- **Proposed Class 5**: Computer programs that enable wireless telephone handsets (''smartphones'') and tablets to execute lawfully obtained software applications, where circumvention is undertaken for the purpose of enabling interoperability of such applications with computer programs on the handset or tablet.[2]

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[1] Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies, Notice of Proposed Rulemaking, United States Copyright Office Docket No. RM 2011-7, 76 Fed. Reg. 78,866 (Dec. 20, 2011). *available at* http://www.copyright.gov/fedreg/2011/76fr78866.pdf [hereinafter Notice of Proposed Rulemaking].

[2] Comments of Electronic Frontier Foundation at 1 (Dec. 1, 2011) *available at* http://www.copyright.gov/1201/2011/initial/eff.pdf [hereinafter EFF Comments].

- **Proposed Class 6a**: Computer programs, in the form of firmware or software, including data used by those programs, that enable mobile devices to connect to a wireless communications network, when circumvention is initiated by the owner of the device to remove a restriction that limits the device's operability to a limited number of networks, or when circumvention is initiated to connect to a wireless communications network.[3]

I. Commenting Party

The New America Foundation's Open Technology Initiative ("OTI") formulates policy and regulatory reforms to support open architectures and open source innovations, and facilitates the development and implementation of open technologies and communications networks. OTI promotes affordable, universal and ubiquitous communications networks through partnerships with communities, researchers, industry and public interest groups and is committed to maximizing the potentials of innovative open technologies by studying their social and economic impacts—particularly for poor, rural, and other underserved constituencies. OTI provides in-depth, objective research, analysis, and findings for decision-makers and the general public.

II. Introduction and Summary

New America Foundation's Open Technology Initiative urges the Librarian to grant the exemptions to the Digital Millennium Copyright Act for the cases where circumvention takes the form of "jailbreaking" or "unlocking" a wide range of mobile devices including smart phones and tablets for the purposes of connecting to telecommunications or data networks outside the design of the manufacturer. Although there are additional exemption classes that would provide consumer benefits, we limit the scope of our comments to those that directly impact our Commotion project.

Commotion is an open-source software project under development by OTI with partners including the Guardian Project, the Work Department LLC, the Serval project and its developers based at Flinders University in Australia, and several independent software developers.[4] The project has frequently been referred to as the "Internet in a Suitcase" after a June, 2011, front page article in *The New York Times*[5] and is focused towards developing an open-source application suite that can be installed on a wide range of off-the-shelf devices including laptops, consumer Wi-Fi routers, and mobile devices such as tablets or smart phones. Traditional wireless networks have a hub-and-spoke physical topology with multiple devices connecting to a single

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[3] Comments of Consumers Union at 1 (Dec. 1, 2011) *available at* http://www.copyright.gov/1201/2011/initial/consumers_union.pdf [hereinafter CU Comments]

[4] Commotion Wireless, https://tech.chambana.net/projects/commotion (Last visited Feb. 9, 2012).

[5] James Glanz & John Markoff, U.S. Underwrites Internet Detour Around Censors, N.Y. Times, June 12, 2011, at A1 *available at* http://www.nytimes.com/2011/06/12/world/12internet.html?pagewanted=all

gateway or Wi-Fi router, while a mesh wireless network offers users the ability to connect directly to each other, device to device to create a local area network.[6]
In addition to a mesh networking protocols, Commotion also integrates open-source GSM (Global System for Mobile Communication) protocols. GSM is the network standard for most mobile communications networks, and integrating GSM into the project's design allows anonymous phone calls and texts messages to devices on the network including unlocked mobile devices.

Commotion is a flagship Internet freedom software project of OTI funded by the U.S. Department of State's Internet Freedom Initiative with additional funding from Radio Free Asia. Designed as a network with an emergent topology, use cases for Commotion include deployment in countries where governments have attempted to silence democratic communications by limiting or shutting off communications networks, such as Tunisia, Egypt, and Libya, as well as in disaster recovery scenarios where central communications infrastructure is lacking or has been destroyed. However, the project is not limited to international deployment and is being field tested in Washington, DC, and Detroit, Michigan.[7]

III. In Support of Exemption Class 5

Proposed Class: Computer programs that enable wireless telephone handsets (''smartphones'') and tablets to execute lawfully obtained software applications, where circumvention is undertaken for the purpose of enabling interoperability of such applications with computer programs on the handset or tablet.[8]

A. Background on Ad-hoc Networking

Commotion is a communications platform, built on open standards and open software, when installed on many of the mobile devices available today, can enable a different and valuable type of networking. Most smartphones, tablets, e-readers and similar devices on the market today include Wi-Fi radios. These devices implement one or more of the IEEE Wi-Fi specifications

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[6] *See,* An Introduction to Mesh Networking, http://newamerica.net/publications/policy/introduction_to_mesh_networking (last visited Feb. 9, 2012).
[7] Ryan Singel, U.S.-Funded Internet Liberation Project Finds Perfect Test Site: Occupy D.C., Wired, Dec. 15, 2011, http://www.wired.com/threatlevel/2011/12/internet-suitcase-dc/all/1; Joshua Breitbart, How Local Can You Get? Michigan Welfare Rights Organization Uses a Wireless Network to Get Its Message Out in Downtown Detroit, Open Technology Initiative at New America Foundation, Dec. 21, 2011, http://oti.newamerica.net/blogposts/2011/how_local_can_you_get_michigan_welfare_rights_organization_uses_a_wireless_network_to.
[8] EFF Comments, *supra* note 2, at 1.

including 802.11a, 802.11b, 802.11g, or 802.11n. Networks based on these standards include the nearly ubiquitous Wi-Fi connectivity users enjoy today, including connectivity in private or semi-private locations such as home or businesses, or more public venues such as coffee shops or airplanes. These networks are known as *infrastructure mode* networks, which means that laptops and other devices connect to a central wireless access point that manages all communication between devices and the Internet. For example, your home may have two smartphones, a tablet and a laptop that connect to your home broadband connection through a wireless router.

Devices with Wi-Fi radios are also capable of another type of networking. In addition to *infrastructure mode* networks, Wi-Fi radios can also be used for Independent Basic Service Set (IBSS) networking.[9] These networks support the same Internet Protocol (IP) data transfer as *infrastructure mode* networks -- and the Internet -- but the key difference is that while *infrastructure mode* networks have a router linking different devices, IBSS networks can connect directly between multiple user devices. Further, IBSS networks allow multiple devices to directly connect to each other to create a mesh. Mesh networks can be ad-hoc and an easier method for deploying a network than connecting multiple routers with wires to cover a wider area. Use cases for mesh networking includes areas where communications have been been shut off, such as by authorities to silence democratic communications, or in disaster scenarios where central communications infrastructure is limited or has been destroyed.

B. IBSS Networking Requires Jailbreak on Android devices

Jailbreaking is often required to enable mesh networking on Android devices. IBSS functionality is possible with any hardware that supports the 802.11 Wi-Fi specification and is supported by the Linux, Windows, Mac OS X, and iOS. But, although Android devices often have Wi-Fi radios and from a technical standpoint are capable of supporting IBSS, the stock builds of the Android software package do not include the requisite software. This omission forces applications like Commotion to rely on circumventing access controls to use IBSS networks. However, if users circumvent the many restrictions on their device to install Commotion, a legally available computer program, they can support IBSS functionality. Commotion also requires the ability to modify a device's routing table, which also requires circumventing a device's access controls, but is completely separate from the ability to use IBSS networks.

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[9] IEEE Standard for Information technology—Telecommunications and information exchange between systems—Local and metropolitan area networks—Specific requirements Part 11: Wireless LAN Medium Access Control (MAC)and Physical Layer (PHY) Specifications, IEEE Computer Society, June 12, 2007, at 25, *available at* http://standards.ieee.org/getieee802/download/802.11-2007.pdf [hereinafter IEEE Standards Part 11].

For example, Google, the company that manages the Android project, restricts access to several functionalities in Android on which Commotion depends to operate. Specifically, the physical radio and controlling hardware that is built into Android devices is capable of IBSS functionality, as is thes oftware driver for the radio hardware. However, Google has removed the capability to recognize existing IBSS networks from wpa_supplicant, a Free Software ("GPL") software that provides Windows and Linux systems methods for remembering wireless networks configurations and for detecting and connecting to new wireless networks. This capability is essential for Commotion and creating mesh networks. Google's application programming interface ("API") does not allow application developers to design programs that access IBSS networks. Google has also not included any way for Android device users to create or connect to IBSS networks.

C. "Jailbreak" exemption should include a broad range of mobile devices

The exemption allowing circumvention to install lawfully obtained software, otherwise known as jailbreaking, should be expanded and should apply broadly to devices such as smartphones and tablets. As we explain above in *III. A.*, Android based devices often built with internal Wi-Fi radios but IBSS functionality has been restricted by the Android operating system. Wi-Fi capable Android-based devices include not only smartphones, but tablets and e-readers as well, and these all of these devices could be capable of IBSS functionality though software. As a result, the process of installing software to enable IBSS functionality is similar from a smartphone to a tablet and so on. Considering the minor differences between devices, with tablets and smartphones both being essentially miniature computers with the same software and radios but different screen sizes, the same exemptions would apply to both. The Electronic Frontier Foundation ("EFF") argues that the current restrictions harm competition and innovation.[10] As we have explained, these restrictions prevent IBSS functionality and adversely affect the installation and use of mesh networking software including those supported by Commotion. Thus, we urge the Librarian to adopt the Class 5 exemption proposed by EFF(.[11]

D. Jailbreak does not violate copyright

As EFF notes in their comments proposing this Class of exemptions, smartphone and tablet manufacturers "implement technological protection measures that restrict the applications that users can run on their devices."[12] However, circumvention to install Commotion, and therefore to change the IBSS access controls on Android devices, does not infringe on any copyright. EFF notes that jailbreaking "firmware is transformative because it expands both the firmware's functionality and that of the independently created applications that it allows users to run on their

[10] EFF Comments, *supra* note 2, at 4-10.
[11] Notice of Proposed Rulemaking, *supra* note 1, at 78867.
[12] EFF Comments, *supra* note 2, at 3.

devices."[13] Indeed, the transformative act of enabling a IBSS network on a mobile device unlocks a new functionality to the existing hardware on mobile devices: the ability to create or join a peer-to-peer network. In order to circumvent IBSS access controls, the owner accesses the firmware merely to utilize the full functionality of the Wi-Fi radio.

IV. In Support of Exception Class 6A

Proposed Class: Computer programs, in the form of firmware or software, including data used by those programs, that enable mobile devices to connect to a wireless communications network, when circumvention is initiated by the owner of the device to remove a restriction that limits the device's operability to a limited number of networks, or circumvention is initiated to connect to a wireless communications network.[14]

A. Background

In addition to granting the exception that would permit jailbreaking, we also urge the Librarian to grant an exception for "unlocking." Mobile devices, including smartphones and tablets, are often "locked". That is, they have technological measures that restrict a given device to a single or limited number of communications networks.

This restriction directly impacts Commotion. In addition to supporting mesh networking, Commotion will also allow "GSM cell phones to connect and exchange anonymous calls, text messages, and other information with other devices on the network."[15] Device owners can use any unlocked GSM device on an arbitrary GSM network, providing that the network owner (if there is one) allows it. However, the Commotion software will be able to route calls and data on the network without a human operator first registering unique GSM devices. As a result, users connected to the network will be able to make GSM calls to other phones on the network. Another project, OpenBTS, has also helped develop an open-source standard for GSM base stations and has tested open GSM networks.[16]

In fact, the ability for user to connect a GSM devices to a network is built into the GSM specification. Similar to a user on a laptop connecting to an open Wi-Fi network, someone with an unlocked GSM-capable device can review available networks and choose which to connect to.

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[13] *Id.* at 11-12.

[14] Consumers Union Comments, *supra* note 3, at 1.

[15] Commotion Wireless, https://tech.chambana.net/projects/commotion (Last visited Feb. 9, 2012). Additionally, we note that GSM, Global System for Mobile Communications, is the technology used by the vast majority of phones throughout the world.

[16] *See*, Fakalofa Lahi Atu, http://openbts.blogspot.com/2010/03/fakalofa-lahi-atu.html (last vistited Feb. 10, 2012).

For example, a user in Washington, DC, with an unlocked smartphone could choose to connect to either T-Mobile's or AT&T's network, the two commercially available GSM networks in the city, provided their device supports the necessary radio frequencies and they purchase service from both carriers.

Unlocking devices is an important component for Commotion development, and exemption is currently offered to "wireless telephone handsets" and specifies access to a "wireless telecommunications network" that is "authorized by the operator of the network."[17] During this round of comments, the Copyright offices has received three proposed classes to expand the unlocking exception.[18] Of these three proposed classes, Class 6A, proposed by Consumers Union, targets "mobile devices" and specifies "circumvention is initiated by the owner of the device to remove a restriction that limits the device's operability to a limited number of networks, or circumvention is initiated to connect to a wireless communications network" best reflects the range of devices available as well as the types of networking a user might require, including those supported by Commotion.

B. Definition of Mobile Devices

The current exemption for unlocking applies, by definition, to "wireless telephone handsets" but this definition does not reflect the range of devices that can and are locked to mobile communications networks. However, the Librarian has received two definitions. Consumers Union argues that exemptions be applied beyond "wireless telephone handsets" but "a variety of dynamic multipurpose devices—including smartphones, touchscreen devices, tablets, e-readers, and so on."[19] MetroPCS similar expresses concerns with the current exception based on the phrase "wireless telephone handsets." They note that the term "is not commonly or traditionally used in the communications world, and is too limited."[20] For example, MetroPCS wants to clarify that the exemption applies to devices such as tablets.

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[17] This circumvention is specified in Copyright Office Final Rule on the Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technology 75 Fed. Reg. 43825 (July. 27, 2010) (to be codified at 37 C.F.R. pt. 201) [hereinafter Final Rule], which states: "Computer programs, in the form of firmware or software, that enable used wireless telephone handsets to connect to a wireless telecommunications network, when circumvention is initiated by the owner of the copy of the computer program solely in order to connect to a wireless telecommunications network and access to the network is authorized by the operator of the network." (at 43830); and

[18] Three classes, 6a, 6b, and 6c are listed in the Notice of Proposed Rulemaking, *supra* note 1 at 78867.

[19] CU Comments, *supra* note 3, at 2.

[20] Comments of MetroPCS Communications, Inc., Dec. 1, 2011, at 4, *available at* http://www.copyright.gov/1201/2011/initial/metropcs.pdf [hereinafter MetroPCS Comments].

We agree with Consumers Union, MetroPCS and others pressing for an exemption that applies to a wider range of devices, and argue that the term "mobile devices" best reflects the available range of devices and is more consistent with present terminology among users, regulators, and manufacturers than the original term "wireless telephone handsets."

C. Exempting the unlocking of new New and Used Devices

We agree with Consumers Union that exemption should not be limited to computer programs operating on "used" devices. Some device manufacturers have chosen to sell "unlocked" devices directly to consumers.[21] The Open Technology Initiative currently supports its testbed networks through distributing Wi-Fi devices with Commotion pre-installed. OTI could expand this practice to distributing unlocked mobile phones that are ready to make calls on Commotion networks.

D. The exempting should apply broadly, not just when the goal is to connect to a network when "access to the network is authorized by the operator of the network"

Connecting to a network with a central authority should not be a prerequisite requirement for unlocking a device. However, this is a requirement of the current exemption and is included in two of the proposed class 6 exemptions. The current exemption allows circumvention when a computer program is run "solely in order to connect to a wireless telecommunications network and access to the communications network is authorized by the operator of the communications network."[22] This language suggests that circumvention is exempted if the user is intending to connect to a network with a central authority. This interpretation is reflected in two of the proposed classes: class 6b proposed by Youghiogheny Communications, LLC, and class 6c proposed by MetroPCS and RCA (filing separately), which suggest that the exemption should only apply when circumvention is done with the intention of connecting networks that are controlled by a central authority. These two definitions would allow circumvention "in order to connect to a wireless communications network and access to such communications network is authorized by the operator of such communications network."[23]

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[21] Apple's website offers the iPhone 4S or the iPhone 4 unlocked. *See* iPhone 4s http://store.apple.com/us/browse/home/shop_iphone/family/iphone/iphone4s, iPhone 4 http://store.apple.com/us/browse/home/shop_iphone/family/iphone/iphone4. Unlocked phones, such as the Google Nexus One, can be purchased unlocked from Amazon. *See* http://www.amazon.com/Google-Nexus-One-Unlocked-Android-U-S/dp/B00332YPHQ

[22] *See* Final Rule, *supra* note 17.

[23] Comments of Youghiogheny Communications, LLC, Dec. 1, 2011, at 2, *available at* www.copyright.gov/1201/2011/initial/youghiogheny_comm.pdf [hereinafter Youghiogheny Comments]; MetroPCS Comments, *supra* note 20, at 2; Comments of RCA-The Competitive

The current definition and those proposed by Youghiogheny Communications, LLC, and class 6c proposed by MetroPCS and RCA (filing separately) do not does not include scenarios where network operators instead want to support an open network rather than require authorization. [24] Open GSM base-stations, such as those used by Commotion, do not require authorization and can allow end-users to establish the connection themselves. This feature can be particularly advantageous in emergency scenarios where the focus is providing maximum access to communications rather than requiring uses to gain permission from a central authority.

OTI supports the class, proposed by Consumers Union, "to remove a restriction that limits the device's operability to a limited number of networks, or circumvention is initiated to connect to a wireless communications network."[25]

E. Definition should be updated to "wireless communications networks."

As Consumers Union notes, a shift in exemption language from "wireless telecommunications networks" to "wireless communications networks" reflects the change in usage of mobile devices from a time when "cellular handsets were used primarily to make voice calls," to today, when "mobile devices are used for a wide range of other types of communications, including SMS, MMS, VoIP, email, chatting, and social network messages.[26] The term "wireless communications networks" would therefore help reconcile this shift and clarify that the exemption applies to both telecommunications and information services.

F. Unlocking does not infringe copyright

There are three proposed classes to exempt the unlocking of phones and all four commenters agree that unlocking devices does not constitute copyright infringement.[27] The practice does not infringe rights or implicate copyright law. As Consumers Union notes, the unlocking is a "procedure, process, system, [or] method of operation" within the meaning of Section 102(b) of the Copyright Act."[28] Consumers Union also notes that the practice is commonly referred to as

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Carriers Association, Dec. 1, 2011, at 2 *available at* www.copyright.gov/1201/2011/initial/rca.pdf [hereinafter RCA Comments].

[24] Youghiogheny Comments, *supra* note 24, at 2; MetroPCS Comments, *supra* note 20, at 2; RCA Comments, *supra* note 24, at 2.

[25] CU Comments, *supra* note 3, at 1.

[26] *Id.* at 3.

[27] CU Comments, *supra* note 3, at 8-14; Youghiogheny Comments, *supra* note 24, at 4-5; MetroPCS Comments, *supra* note 20, at 15-19; RCA Comments, *supra* note 24, at 3-4.

[28] CU Comments, *supra* note 3, at 9.

"re-flashing" and is "fair use of copyrighted works that they [the end-users] rightfully own."[29] RCA likewise supports unlocking as noninfringing, noting that "the act of connecting a wireless device to a wireless network does not, in itself, implicate the copyright laws and thus does not infringe on the rights of any copyright holder."[30] RCA continues to explain that "the making of modifications in the computer program in order to enable the mobile phone to operate on another network would be a noninfringing act under Section 117."[31] Because the practice does not infringe copyright and the benefits we explained above we urge the the Librarian to exempt unlocking.

V. Conclusion

Commotion is a unique example of the type of networking that is possible with today's mobile devices. Users today walk around with miniature computers in their pockets. Through mesh networking and open-source communications protocols, users can set up their own communications networks. Because Commotion supports decentralized communications, the platform can be an essential tool in supporting communications in repressive regimes or helping rebuild communications networks after disasters. However, as we have explained, the opportunities Commotion affords depend on the ability of users to install their own software on their devices and gain access to radio controls and remove restrictions. Commotion is but a single example of the types of innovations that require circumvention to implement but certainly a valuable example as to why the Librarian should determine that these uses cases are likely to be adversely affected by 1201 (a)(1) and should be exempted.

Respectfully Submitted,
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[29] MetroPCS Comments, *supra* note 20, at 15.
[30] RCA Comments, *supra* note 24, at 4.
[31] Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies, 75 Fed. Reg. 43,825, 43,830 (July 27, 2010) (codified at 37 C.F.R. pt. 201.40) ("The access controls in question are embedded in the mobile phone's firmware or software and prevent the mobile phone owner from gaining access to the settings that connect the mobile phone to a network (e.g., Verizon's) other than the original network (e.g., AT&T's).") at 43,831.

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