

Name and Affiliation

I am Shawn Hernan, a senior member of the technical staff at the CERT Coordination Center (CERT/CC). CERT/CC is part of the Software Engineering Institute, a federally funded research and development center operated by Carnegie Mellon University and dedicated to improving the state of the practice of software engineering. The following reply comments, each supporting or amplifying other comments submitted in the first comment period, are submitted on behalf of the CERT/CC.

Proposed Class(es) of Works

Each of the following classes of works for which the exemption is proposed are preceded by the name of the commenter who proposed such exemption. Each of these reply comments is intended to support or amplify the earlier comments upon which they are based. In some cases, the original commenter's proposed class of works is restated in order to better classify the proposed exemption within a class of works recognized by the Register of Copyrights. In these cases, the commenter's original proposed class of works is listed first, followed by CERT/CC's proposed restatement of that class of works. The Summary and Argument in Support sections of these comments will refer to the proposed classes of work as re-phrased by CERT/CC.

1. Commenter: Jeff Grove, U.S. Public Policy Committee of the Association for Computing Machinery.

Proposed Class of Works: "Literary works, including computer programs and databases, protected by access control mechanisms that fail to permit access to recognize shortcomings in security systems, to defend patents and copyrights, to discover and fix dangerous bugs in code, or to conduct forms of desired educational activities." [Original commenter's phrasing] This category of works can also be described as: Literary works, including computer programs and databases, protected by access control mechanism that prevent (a) legitimate research into the weaknesses of security systems, (b) the detection of unauthorized use or dissemination of intellectual property, (c) the detection and amelioration of potentially destructive defects in computer code, and (d) legitimate demonstrations for educational purposes.

2. Commenter: Samuel Greenfeld

Proposed Class of Works: Literary works, including computer programs and databases, protected by access control mechanisms that are at high risk of failure in the near-term future because of malfunction, damage or obsolescence.

3. Commenter: Samuel Greenfeld

Proposed Class of Works: Literary works, including computer programs and databases, protected by access control mechanisms that fail to permit access

because of the copyright owner and/or their designated agent fail to provide the necessary support means.

Summary of the Argument(s)

1. Access controls that prevent (a) legitimate research into the weaknesses of security systems, (b) the detection of unauthorized use or dissemination of intellectual property, (c) the detection and amelioration of potentially destructive defects in computer code, and (d) legitimate demonstrations for educational purposes both undermine legitimate, non-infringing uses of protected works and also are likely to cause additional harm by allowing security flaws and potentially destructive flaws in computer code to remain undetected. Such undetected security flaws are likely to be exploited by hackers and others with malicious intent. Undetected defects in computer code are likely to cause substantial and costly damage to computer systems, potentially including critical national infrastructure. Access controls that prevent owners of protected works from identifying misuse or misappropriation of such works serve only to prolong and increase the substantial harm that occurs when such works are infringed. Finally, where legitimate educational demonstrations cannot be conducted without the circumvention of an access control, real harm is occurring in that the anti-circumvention prohibition has created a chilling effect that is hampering education and research.
2. Literary works, including computer programs and databases, protected by access control mechanisms that are at high risk of failure in the near-term future because of malfunction, damage or obsolescence are likely to present a risk to users of failures that may be costly to remedy. The proposed exemption is fully supported by the rationale adopted by the Register in the initial exemption rulemaking under Section 1201(1)(a)(3) for exempting works whose access controls have already been subject to malfunction, damage, or obsolescence. While the proposed exemption seeks to cure harm in a preventative way, rather than in a post-failure corrective way, the harm being sought to be corrected is the same: the inability of users of works to access works to which they have acquired valid rights of use.
3. Where access controls prevent a user of a work from accessing the work where (a) the user has obtained valid rights to access the work, and (b) the user is frustrated in his or her attempts to access such work because the copyright owner or distributor of the work have failed to provide the user with necessary support (such as valid access codes, instructions, or where access controls have been improperly enabled or employed), substantial harm is likely to occur, i.e. the inability of a user to exercise his or her rights of use. Substantively, this category of works is no different than works whose access controls have been subject to malfunction, damage, or obsolescence, for which the Register granted an exemption during the initial exemption rulemaking.

Argument in Support

Proposed Exemption # 1

Class of Works

Literary works, including computer programs and databases, protected by access control mechanism that prevent (a) legitimate research into the weaknesses of security systems, (b) the detection of unauthorized use or dissemination of intellectual property, (c) the detection and amelioration of potentially destructive defects in computer code, and (d) legitimate demonstrations for educational purposes.

Technological Controls

The technological controls used to control access to this category of works may be intended to serve other functions, but either intentionally or unintentionally also produce the effects described in the proposed class of works.

Prevented Activities

This category of works is defined by the types of non-infringing activities that it prevents, namely:

- (a) legitimate research into the weaknesses of security systems,
- (b) the detection of unauthorized use or dissemination of intellectual property,
- (c) the detection and amelioration of potentially destructive defects in computer code, and
- (d) legitimate demonstrations for educational purposes.

Related Harms

The inability to conduct research into security flaws results in security flaws remaining undetected and unremediable by legitimate researchers, increasing the likelihood that such flaws will be discovered and exploited by hackers and others with malicious or criminal intent. Preventing the discovery of such flaws by enforcing the anti-circumvention prohibition against legitimate researchers (who may not otherwise qualify for the exception available under Section 1201(g) or (j)) is likely to lead to more security flaws remaining undetected, and more resultant harm to the information assets of businesses and individuals.

Actual harm resulting from the anti-circumvention provisions, with respect to security research, is already occurring.

Theft and misuse of legally protected intellectual property were the underlying basis for the passage of the DMCA. Accordingly, where Section 1201(a) can be used to prevent the detection of misuse or infringement of intellectual property, the broad goals and legislative intent of the DMCA are undermined. In order to support these goals and further the legislative aims of the DMCA, the proposed exemption should be granted. Substantial harm is likely to occur in the absence of the proposed exemption, in that the piracy of intellectual property will be more difficult to detect, which presents a serious

risk of lost revenue to the owners of such intellectual property who are impeded from detecting and remedying infringements of their rights.

To the extent that access controls to protected works prevent the detection and amelioration of potentially destructive defects in computer code, users (including researchers) must have the ability to legally circumvent such access controls in order to prevent substantial potential harm to computer hardware and software, as well as electronic information assets. The inability to diagnose and correct flaws in computer code is likely to create substantial system failures, losses of valuable data, and other related harm.

Instruction in the field of computer security often relies on classroom or other instructional demonstrations of flaws in computer security. To the extent that such demonstrations require the circumvention of an access control to a protected work, the anti-circumvention prohibition serves to stifle legitimate educational activities.

Effects of the Proposed Exemption

1. Effect on Availability

Unless the proposed exemption is granted, many of the technological measures that would otherwise be capable of exempt circumvention may be inaccessible to the research, detection, and educational activity that is contemplated.

2. Effect on Teaching, Research, and Scholarship

The proposed exemption will have a positive effect on teaching, research, and scholarship. The availability of independent research on existing software flaws directly aides and promotes teaching and scholarship by adding to the existing body of knowledge concerning software technology and products. The ability to use demonstrations of security flaws in an educational setting helps develop the next generation of security researchers.

3. Effect on the Market

The proposed exemption will have a long-term beneficial effect on the market. The use of protected works in digital form is likely to be improved in an environment where security flaws and defects in computer code can freely be identified, discussed, and remediated. Awareness in the marketplace that products will be independently tested and flaws identified and remediated will tend to increase market confidence in such products.

4. Effect on Copyright Owners

The proposed exemption will have no effect on the rights of copyright holders. The proposal is limited to legally acquired protected works (including demonstration and trial versions).

Proposed Exemption # 2

Class of Works

Literary works, including computer programs and databases, protected by access control mechanisms that are at high risk of failure in the near-term future because of malfunction, damage or obsolescence.

Technological Controls

The proposed class of works is identified by a certain type of access control—those at risk of near-term failure due to malfunction, damage, or obsolescence.

Prevented Activities

The inability to circumvent an access control in order to identify a risk of failure of such access control (which would thus prevent access to the underlying protected work) precludes the possibility of preventive identification and remediation of such potential faults and flaws.

Related Harms

The damage, losses, and other harm that result from a failure of an access control to a protected work (that the user otherwise has a legal right to access) will continue to be suffered if the proposed exemption is not granted. The proposed exemption would allow the early identification of potential failures of access controls that, in turn, would allow for preventive maintenance to occur which would mitigate the harms that would otherwise occur.

Effects of the Proposed Exemption

The proposed exemption is fully supported by the rationale adopted by the Register in the initial exemption rulemaking under Section 1201(1)(a)(3). In that rulemaking the Register allowed the circumvention of access controls that had failed due to malfunction, damage, or obsolescence. This proposed exemption seeks to expand upon this prior exemption to allow for the prevention of the type of failures that the Register has already accepted as justifying an exception to the anti-circumvention prohibition. Researchers and users of computer programs should not have to suffer actual harm (including interruption of business and associated financial losses) as a prerequisite to having the legitimate right to diagnose and preventively correct impending security failures. In particular, researchers would not have, absent the adoption of the proposed exemption, the ability in all cases to legally identify and cure potential security failures.

1. Effect on Availability

Unless the proposed exemption is granted, many of the preventive technological measures discussed above would be inaccessible to the research activity that is contemplated.

2. Effect on Criticism, Comment, and News Reporting

The proposed exemption will have a positive effect on criticism, comment, and news reporting by better assuring that threats of DMCA violations will not stand as a barrier to the evaluation of software security flaws and the creation of preventive solutions before harm is actually incurred.

3. Effect on Teaching, Research, and Scholarship

The proposed exemption will have a positive effect on teaching, research, and scholarship. The availability of independent research on existing and potential software flaws directly aids and promotes teaching and scholarship by adding to the existing body of knowledge concerning software technology and products.

4. Effect on the Market

The proposed exemption will have a long-term beneficial effect on the market. The use of protected works in digital form is likely to be improved in an environment where flaws can freely be identified, discussed, and remediated. Awareness in the marketplace that products will be independently tested and flaws identified and remediated will tend to increase market confidence in such products.

5. Effect on Copyright Owners

The proposed exemption will have no effect on the rights of copyright holders. The proposal is limited to legally acquired protected works (including demonstration and trial versions).

Proposed Exemption # 3

Class of Works

Literary works, including computer programs and databases, protected by access control mechanisms that fail to permit access because of the copyright owner and/or their designated agent fail to provide the necessary support means.

Technological Controls

The technological controls to this proposed class of works are those that otherwise properly control access to protected works, but that do not facilitate access to such works by persons legally authorized to access them because of the failure of a seller or licensor of such works to provide adequate technical information or support.

Prevented Activities

The legal access and use of the proposed class of works by legally authorized users is prevented, absent the proposed exemption.

Related Harms

Without the proposed exemption, sellers and distributors of access-protected works will have less incentive to provide adequate technical support to the authorized users of such works. Additionally, there will be no self-help remedies available to users of the

proposed class of works, who are prevented from exercising their lawfully-acquired rights of use.

Effects of the Proposed Exemption

1. Effect on Availability

Unless the proposed exemption is granted, lawfully authorized users of protected works will, in some instances, be prevented from accessing these works. Qualitatively, the harm of not granting the proposed exemption would be very similar to not allowing the circumvention of access controls that have failed due to malfunction, damage, or obsolescence. The Register has previously approved an exemption for these classes of works.

2. Effect on Criticism, Comment, and News Reporting

The proposed exemption will have a positive effect on criticism, comment, and news reporting by better assuring the availability for use of protected works lawfully obtained by persons engaged in these activities.

3. Effect on Teaching, Research, and Scholarship

The proposed exemption will have a positive effect on teaching, research, and scholarship by better assuring the availability for use of protected works lawfully obtained by persons engaged in these activities.

4. Effect on the Market

The proposed exemption will have a beneficial effect on the market. Users who lawfully acquire the rights to access and use protected works will have increased guarantees of their ability to so access and use such works. Manufacturers and distributors of computer programs, databases, and other works will be incentivized to supply lawful users with the tools, information, and technical support needed for such users to access and use such works because such manufacturers and distributors will know that if such support is not supplied, users have the right to circumvent the attached access controls.

5. Effect on Copyright Owners

The proposed exemption will have no effect on the rights of copyright holders. The proposal is limited to legally acquired protected works (including demonstration and trial versions).