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MMOWGLI Player-Protection Considerations for Open-Source Software Release

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1. **Achievable Goals**. The MMOWGLI community will publicly release and encourage broad adoption of its proven open-source software platform in a manner that best reduces risks and increases benefits to potential players. NPS and Navy users will continue to follow IRB protocols as appropriate. Although external adopters do not fall under such jurisdiction, and malice or neglect cannot be prohibited, many actions can nevertheless be taken to help prevent problems and encourage proper use of this powerful collaboration tool. Game guidance and default configurations will make it easy to "do the right thing."

2. **Game Description**. MMOWGLI, the Massive Multiplayer Online Wargame Leveraging the Internet, enables collaborative thinking and innovation. Players build Ideas and Action Plans together on the Web. MMOWGLI games have focused on a wide variety of group challenges and wicked problems that might otherwise resist easy solutions. Details can be found on the public MMOWGLI Players Portal at

https://portal.mmowgli.nps.edu

3. **Player Prerequisites**. Individuals who want to participate in a MMOWGLI game must first agree to meet a number of Terms and Conditions prior to play.

http://portal.mmowgli.nps.edu/game-wiki/-/wiki/PlayerResources/Terms+and+Conditions

4. **Game Master Portal**. Individuals expressing interest are granted accounts on the MMOWGLI Game Masters Portal which includes further details regarding game preparation, user administration, software development, and other resources. Requests for participation are welcome. They should include a brief rationale why access is desired, and can be sent to:

mmowgli@nps.edu or brutzman@nps.edu

5. **Software Capabilities**. The MMOWGLI game platform is a complex suite of fully open-source software that is maintained under version control. Access to the code base is available on request. Multiple programmers are currently able to compile and run the code for creating and testing improvements. Further software development is ongoing to improve mobile access, expand reporting capabilities, and simplify deployment of new MMOWGLI game server. All of these tasks remain substantial undertakings, but are continuing with an eye towards establishing a larger open community of stakeholders interested in extending and protecting the MMOWGLI platform. For account holders, details are found on the MMOWGLI Game Master Portal at

http://portal.mmowgli.nps.edu/web/portal

6. **Designing for Player Protection**. Our ongoing design strategy has been to include all such player protections in the MMOWGLI software whenever possible, making it "easy" to do the right thing and "hard" to do the wrong thing whenever using the MMOWGLI game platform. MMOWGLI allows players to assume an alias while carefully guarding against the inadvertent release of Personal Identifying Information (PII). Multiple precautions are provided to new players regarding potential risk and benefit. Multiple protections are built into the software to protect emails, passwords, and other PII. Thorough moderation and administration procedures are scrupulously followed in order to help safeguard player privacy and avoid abuse. One alternative possibility is that we might not release security-related software components, effectively crippling the rest of an open-source platform, but unfortunately that approach runs the risk of a third-party creating software workarounds that hold no protections whatever. Thus omission-based approaches can backfire. Of note however is that licensing agreements can help. The choice of a "viral" open-source license (requiring that all changes be reported back to the repository) offers good visibility into potential vulnerabilities. It also provides a well-understood legal framework regarding indemnity, reporting and use. Requiring acknowledgement prior to gaining access to the source also helps. The most useful license in this regard is the GNU General Public License (GPL).

http://www.gnu.org/licenses

7. **Risks, Benefits, Informed Consent**. Certainly potential risks and benefits exist for players in a MMOWGLI game, as described in detail under the approved "Informed Consent to Participate in Research" that all players are required to acknowledge. Of course proper consent cannot be granted if the game information provided is incorrect or misleading. Of further note is that addition of potential protections for use with minors (age 16-17, or even younger) are quite significant and have not yet been formally pursued. Minors are not considered capable of granting consent, and thus any protective measures would need to include informing parents and school officials, as appropriate. A critical capability gap for most games is the inability to authoritatively confirm any participant's age.

http://web.mmowgli.nps.edu/mmowMedia/MmowgliGameParticipantInformedConsent.html

8. **Human Research Protections**. Currently MMOWGLI games are only allowed to proceed under a set of human research protection protocols administered by the NPS Institutional Review Board (IRB). Current protections are deemed sufficient for adults (age 18 and older). The NPS IRB further allows partnerships with individual investigators and external IRBs to ensure all protocol requirements are met. Approved documents and full details are available on the game master portal at

http://portal.mmowgli.nps.edu/web/portal/wiki/-/wiki/GameMasters/IRB+Protocol+Documents

We foresee the likelihood of prepared human-subjects protection guidance for several common examples of MMOWGLI game use. Primary categories of interest include:

- Wide-open public discussion
- Community of interest, perhaps with invited experts or selected outside contributions
- Invitation-only workshop attendees, or student classes enrolled in an educational course
- Science Technology Engineering Math (STEM) students under supervision, 16-17 years old
- Minors under age 16: no protocol expected, likely recommending against such use

9. **Open Source is Freely Distributed**. Open-source software licenses do not discriminate against who can use the code. However, in the case of MMOWGLI to date, we have been judicious in granting access to the source code in order to avoid the possibility of arbitrary code modifications and usage before social, privacy and security issues are properly thought through and supported. No requests to date have been rejected. Hybrid open-source models are also possible. Perhaps granting access to certain sensitive modules in the source code might be restricted to those agreeing to comply with both the spirit and constraints provided by MMOWGLI community protections against risk. We do recognize the possibility that any serious "bad actor" can thwart most policy restrictions through determined efforts.

Wikipedia: Open source, https://en.wikipedia.org/wiki/Open_source

Open Source Initiative (OSI), http://opensource.org

Savage Developers Guide, https://savage.nps.edu/Savage/developers.html#Licensing

10. **Other Exemplars**. Investigation to date has not revealed many project or policy exemplars that might guide us in this fast-moving area of social media and crowd sourcing. Examples of possible interest are welcome. In general, the legal policies of commercial companies deploying social media platforms have grown increasingly permissive with regards to participation by minors, providing private channels that can enable anonymous abuse, and other problem areas. Nevertheless, discouraging random acts of bad behavior by spotlighting worthwhile efforts might still add value. Establishing a community organization might provide opportunities such as certification and branding to confirm that games “on the approval list” are each using community-developed MMOWGLI software, and following best practices for protecting against player risk.

11. **Limitations**. It is important to recognize that it is not necessarily possible to protect against all potential attacks or abuses that may occur. Problem analysis follows. We need to pursue a practical balance that reduces risk and increases benefits. How can these important concerns best be addressed?

In general, I think trying to force other organizations to follow current mmowgli security rules is akin to hiding cookies from yourself so you won’t eat them. Since you did the hiding, you can still find them, even if you try to pretend that you don’t know that they’re in the cupboard above the stove that’s hard to reach, but without the use of the step ladder in the garage that you used to put them into the cupboard in the first place.

In the same way, if they’ve got the source code they can do what they like with it, including removing security. That’s what the freedom of open source allows. I don’t think you can square the circle of saying both “this code is free and open” and “use it only in the way we insist upon."

What we can do it try to make the default security settings high, and make people take positive steps to remove them. Since people are lazy most will go with the flow and use the high security settings. If they remove them they’ll have to have some degree of skill—they’d have to know how to compile the code, at the least. That’s more work than most people are willing to go through. – Don McGregor, NPS

12. **Information Assurance (IA) Considerations**. The MMOWGLI game platform assumes that a secure network environment protects the game server. Other sponsors of networked MMOWGLI servers will need to meet similar levels of protection, or else risks to players may increase dramatically.

- The current software design for the MMOWGLI architecture follows a large number of industry best practices, including a 3-tier architecture with multiple layers of protection against attacks, strong encryption of Personal Identifying Information (PII), non-recoverable (only resettable) passwords, automated blocking of suspicious network behavior, SQL query injection protection, ready access to trouble reporting, secure email connections, etc. etc.
- The NPS server infrastructure for hosting MMOWGLI games includes a number of safety precautions and is authorized to operate with public access. As the Navy's University, NPS provides a broad and deep set of protections for IA and security including periodic threat scanning, multiple firewalls, network monitoring, etc. Trouble support 24x7x365, periodic reviews and proactive protections are followed. Protection levels are available to meet requirements for operating either on *.edu* or, if appropriate, *.mil* networks.
- Players are only allowed to connect via Web browsers with secure https connections, thwarting "man in the middle" attacks across an insecure Internet.
- Use of the Akamai Content Delivery Network (CDN) not only speeds service to Navy Marine Corps Internet (NMCI) and world-wide users, but also protects NPS servers from direct probing and Distributed Denial of Service (DDOS) attacks. This support contract was renewed in 2014.

Current design efforts towards producing a deployable version of the MMOWGLI server are working to include as many of these protections as possible. It is under construction. Hopefully our automatic default game build, once deployed, can provide the majority of recommended infrastructure IA protections without significant effort or expertise by external game adopters.

http://portal.mmowgli.nps.edu/web/portal/wiki/-/wiki/GameMasters/Network+Security

13. **Proposed Software Release Agreement Policy**. We currently follow the following policy restrictions requiring prior participant agreement when releasing the MMOWGLI platform as unrestricted public open source. Questions and comments are welcome.

a. Users agree to honor the open-source software license, reporting source code changes.
b. Users acknowledge the existence of potential risks and necessary protections.
c. Users commit themselves to support, and not thwart, protections for player privacy and protections against abuse. Suggestions for improvement have great value and are encouraged.
d. The MMOWGLI community maintains an organizational framework to fairly and competently consider both requests for code changes and contributions of new source code.
e. The MMOWGLI community maintains an oversight group for reviewing privacy-related concerns and comments regarding MMOWGLI risks and benefits.
f. The MMOWGLI community will continue to develop and support an openly published codification of best practices, providing an open forum for ongoing review.
g. Periodic external reviews will help to formally ensure that this system is working appropriately.

14. **Execution Strategy and Next Steps**. Applying any constraints whatsoever to open source is an unusual practice, but this approach nevertheless seems warranted to avoid potentially serious problems from emerging in the future. We have therefore postponed unrestricted release of the open source pending formal review of our approach on these challenging topics. The MMOWGLI project requests review and guidance from both game stakeholders and project sponsors regarding the best approaches to follow. We do not want to proceed independently, without relevant review, only to find out later that a major problem has occurred that impacts game sponsors. All questions and suggestions which might further improve the protections offered to game participants remain welcome.

Next steps include:

- Complete: writing up the issues for stakeholder discussion with full transparency throughout;
- Circulate for comment to improve, include prior game sponsors and community stakeholders;
- Potentially discover other programs or community exemplars addressing similar challenges;
- Leadership review, acknowledgement, and comment: ONR, DON HRP, NPS IRB, stakeholders

15. **Acknowledgments**. Establishing online player protections is a completely cross-cutting challenge. As a result, the MMOWGLI project and this particular document each reflect the work of many people. Program manager Garth Jensen of NSWC Carderock has provided clear objectives and sound guidance throughout the lifetime of this project. Jason Tester and colleagues at Institute for the Future (IFTF) provided an innovative and sound design which has served as the foundation for all subsequent progress. Their approaches for new-game design and game moderation have established excellent design benchmarks that we continue to follow. The MMOWGLI software platform itself is built on the strong practices for software engineering and secure network administration established by Don McGregor, Mike Bailey, and Terry Norbraten. Game master training and moderation procedures have been developed and led by Becca Law and Wendy Walsh. Matt Largent of SPAWAR Charleston has provided crucial insights at many points in this development. A large number of checks, constraints, guidance points and support responses have been received from the NPS Information Technology and Academic Computing Services (ITACS) leadership and staff.

Numerous questions and contributions have been provided by other MMOWGLI team members, multiple game sponsors, and over 130 game masters. Thousands of players (anonymous or not) have provided feedback in more than a dozen games, each contributing their ideas and feedback while benefiting from the protections provided by this collaborative game platform. Noteworthy contributions making the game better have been provided by Tom Anderson, Paul Andron, Imre Balogh, Ellie Bartels, Curt Blais, Toni Boadi, Dan Boger, Paul Bruhns, Deborah Buettner, Ray Buettner, Nathan Burkholder, Dan Burns, Frank Busalacchi, Arnie Buss, Jeff Cadman, Melody Cooke, Karen Cooper, Gina Cordero, Ted Delbo, Bill Diaduk, LorRaine Duffy, Lyla Englehorn, Jeff Farlin, Luke Felz, William Frazier, Don Free, Ryan French, Simson Garfinkel, Chris Gaucher, Matt Georges, Marina Gorbis, Artie Gross, James Grover, Nickolas Guertin, Rachel Hatch, Chris Henderson, Jon Huggins, Craig Hughes, Chad Hutchins, Martin Jolly, Julia Kim, Madan Kittur, Mary Lacey, Celine Lai, Sandra Leavitt, Eui Lee, Gilbert Lee, Andrew Lucas, Doug MacKinnon, Jens Vestergaard Madsen, Jeff Malnick, Blake Markovits, Devin Markovits, Gary Markovits, Douglas Maxwell, Ryan McAlinden, Mitch McCarthy, Jenn Miller, Colette Murphy, Rikki Nguyen, Jeff Paduan, Mike Perron, Jessica Piombo, Joelle Presby, Norma Reyes, Phil Richter, Paulette Robinson, Jim Roche, Ed Rockower, Tami Ryley, Balaji Subramaniam, Joe Sullivan, Lisa Trawick, David Tyler, R. Steven Rowe, John Schmidt, Larry Shattuck, Larry Schuette, Garry Shields, Kirk Stork, Karl van Bibber, Kathy Vian, Wayne Wagner, Jeff Weekley, Terry Welliver, Linton Wells, Lyndsay Westby-Gibson, Dan Wilkinson, Jennifer Williams, Jennifer Wolk, Brian Womble, Todd Wwyatt, Ying Zhao, and Derek Zhou. Any omissions in these credits are unintentional and all corrections are gratefully received.

The MMOWGLI team thanks all contributors. Our motto: *play the game, change the game!*