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COMP6441 – Security Engineering

25 July 2025

Security Analysis Report: Wiimmfi vs Pretendo Network

Wiimmfi and Pretendo Network are two community-led projects aimed at reviving discontinued online services for the Nintendo Wii and Wii U respectively. While both platforms have allowed gamers to return to beloved online features, their technical foundations and security practices vary greatly. This analysis assesses their relative security, examines risks, and determines whether either service is safe for long-term use.

Security Comparison

Category	Wiimmfi	Pretendo Network
Encryption	None (Cleartext HTTP)	TLS v1.0 (games) / TLS v1.2 (Juxtaposition)
Data Exposure Risk	High – Exposes tokens, MACs	Medium – TLS used, but mixed standards
Protocol Security	Legacy and insecure	Improved but with variation
Privacy Controls	None	Some (Encrypted logins/sessions)
Stability	Generally stable	Occasionally unstable (timeouts)
Backward Compatibility	Broad (Wii and DS titles)	Focused on Wii U and 3DS titles

Wiimmfi exposes sensitive data such as MAC addresses and game tokens due to its use of cleartext, relying only on Base64 encoding for obfuscation, which is a bit too simple for the kind of high-level information being sent through that could easily be used maliciously if put in the wrong hands. This is not encryption and is easily reversed using freely available tools,

thus from a cybersecurity standpoint, Wiimmfi poses a significant privacy and security risk to its users.

Pretendo, on the other hand, leverages TLS encryption. TLS 1.0 is used for Wii U games, while TLS 1.2 is employed for services like Juxtaposition, offering stronger security for social interactions and account logins. Although TLS 1.0 is considered obsolete, the use of TLS 1.2 where supported is a step in the right direction as it improves overall protection, especially when conversations and personal information is being sent through. Despite all of this, Pretendo experiences compatibility-related performance issues when switching between these encryption standards, but its focus on privacy and integrity makes it a more trustworthy platform overall.

External Comparisons: Other Fan-Made Services

Other fan-made services like OpenSpy (for legacy Xbox/PlayStation games) or Project Lumina (for the 3DS) show different the different perspectives of security and how every service focuses on different practices. OpenSpy mimics GameSpy's original servers and also runs mostly in cleartext, while Lumina enforces HTTPS and enforces server verification. Compared to these, Pretendo sits in the middle—more secure than OpenSpy but less modern than Lumina, which is surprising since Pretendo is actually used for both the Wii U and 3DS, and is also able to leverage the capabilities of the Wii U, an objectively more powerful console. This highlights an important trend: older hardware often limits what encryption standards can be implemented, and community developers, despite their big plans, have to balance security with compatibility.

Threat Model

Wiimmfi's lack of encryption means:

- Traffic can be intercepted and user activity monitored (as shown by my code implementations)
- Accounts or game sessions can be hijacked by attackers
- No protection against man-in-the-middle (MitM) attacks

Pretendo reduces these risks but does not eliminate them. Since TLS 1.0 is deprecated and TLS 1.2 is not used uniformly, sophisticated attackers may still exploit weaknesses. In both

cases, ethical concerns arise about users sharing data over insecure channels, especially in the case of minors (as they are the main target audience for Nintendo games and the Wii U)

Ethical Implications

In such a case, legal ambiguity also exists since both the services do not directly distribute Nintendo content, but instead replicate its online infrastructure. Wiimmfi is known for straight up spoofing Nintendo servers while Pretendo at least changes the links to redirect them to their own Cloudflare and AWS infrastructure. Due to such limiting factors when it comes to ability and availability, any data collection, authentication, or community moderation should be conducted with transparency and care.

One important point I would like to bring up is that there is so much more to this project than just Wireshark trace analysis. I was keen on performing DDoS Attacks, MITM Snooping and API Key Retrieval for Encrytion Reverse Engineering to see how susceptible each of the services was to cyberattacks such as these. When emailing the creators of the services Wiimm (Co-Creator, Wiimmfi) and Jonathan Barrow (Project Lead, Pretendo), I wished to gain uninterrupted access to their services to perform these tests, but sadly, I got no response from either one of them (maybe they were just too busy ☹) and thus, such penetration testing was a no-go due to increasing ethical concerns.

The safest option, but yet thorough, would come in the form of Wireshark Trace Analysis, which I made into my final deliverable, since these yet contained valuable information that could yet come in handy one way or another (especially in the case of Wiimmfi's traces).

Recommendations

- **Wiimmfi**: Definitely not recommended for privacy-conscious users. Only use if you're aware of the risks and take network precautions (e.g., VPN, Isolated Devices, Virtual Machines and Emulators).
- **Pretendo**: Safer to use, but still not at the level of modern services. Users should avoid sharing sensitive data and developers should prioritize upgrading TLS usage across all services.
- Developers should release transparency reports, use signed server certificates, and audit their codebases.

- Casual users should treat these services like beta software: fun and nostalgic, but with understood limitations.

Conclusion

Pretendo is a more secure option compared to Wiimmfi, but neither platform should be treated as entirely secure. They are excellent passion projects that preserve online multiplayer and social experiences for retro consoles, but users must approach them with awareness of their technical and ethical trade-offs.

Final Verdict - *Download with caution.*