Metaverse Standards Forum
NFT Royalties: Peer to Peer NFT Swapping

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Status: Approved for Public Distribution

Version: 1.0

Reviewer	Due Date	Status	Contact
Digital Asset Management Working Group	June 18, 2024	Complete	digital_asset_management @lists.metaverse-standards.org
MSF Domains (Peer Review)	March 05, 2025	Complete	oversight@lists.metaverse-standards.org
Use Case Taskforce	May 05, 2025	Complete	use_case_task_force@lists.metaverse-standards.org

The purpose of this template is to provide a structured framework for collecting and documenting use cases within the Metaverse Standards Forum (MSF). Use cases are essential for understanding real-world scenarios where metaverse technologies are applied and where interoperability challenges may arise. This template guides MSF members in providing a concise yet comprehensive description of a use case, including its title, identifier, and summary. It also encourages contributors to list the benefits of the use case, identify actors or entities involved, and describe the use case scenario in detail, emphasizing interactions, challenges, and requirements. Additionally, it prompts the inclusion of relevant technical information, such as implementations, success metrics, and challenges faced. This template aims to facilitate the gathering of valuable use-case data to inform standards development and foster collaboration within the MSF community.

MSF members and MSF Domain Groups are invited to submit use cases.

NOTE: Organizations such SDOs who want to submit and add a use case would need a sponsor that is an MSF member. This process is established in order to have a contact person in MSF that can handle discussions and resolve open issues within regular meetings.

Eligible submitters:

- MSF Domain Groups
- MSF Members (Principal and Participant)
- External Organizations with Liaison Agreements (with the support of a MSF member that acts as sponsor)
- Standard Development Organizations (with the support of a MSF member that acts as sponsor)

Minimum Requirements for MSF Member Submissions not part of a Domain Group:

- Minimum required number of proposers: 3
- Minimum required number of supporters: 5

NOTE: Use cases submitted by SDOs and Liaison Organizations would also need to fulfill the same requirements (and would need a sponsor) unless they are submitted by a Domain Group.

MSF: *Metaverse Standards Forum*
POG: *Pre-qualified Organizations and Groups*
SPP: *Standards Related Publications and Projects*
DWG: *Domain Working Groups*
WG: *Working Group*
SDO: *Standards Development Organization*

Use Case Title

NFT Royalties: Peer to Peer NFT Swapping

Use Case Identifier

MSF2024-NFTSW-001

- Version 1.0
- Year of Release: 2025

Summary of Use Case

Description: This use case focuses on the payment of royalties with the mechanism of exchanging Non-Fungible Tokens (NFTs) directly between parties without involving FIAT or cryptocurrency payment. It emphasizes a peer-to-peer model where digital assets represented as NFTs can be traded based on mutual agreement of value, fostering a barter-like system in the digital asset realm. This process enhances asset liquidity, enables collectors to diversify their portfolios, and allows creators to directly engage in asset exchange. Note that this use case is similar to the Internal Transfer use case except that the parties that own the wallets are different and NFTs are swapped rather than transferred.

Benefits of Peer to Peer (P2P) NFT Swapping:

- Enhanced liquidity for NFTs, allowing owners to trade assets without cash transactions.
- Portfolio diversification for collectors and creators.
- Direct engagement and negotiation between parties, bypassing intermediaries.
- Encouragement of a vibrant trading ecosystem within the NFT community.

Contributors and Supporters

- Digital Asset Management Working Group
- MSF Domains (Peer Review)
- Use Case Taskforce

Keywords

NFT, Swapping, Digital Asset Exchange, Peer-to-Peer Trading, Blockchain, Decentralized Finance, Asset Liquidity, Portfolio Diversification, Smart Contracts, Interoperability

Actors/Entities

- **Creator:** the individual or entity that creates the digital asset which is represented as an NFT. This includes primary creators and secondary creators who contribute to the creation of the NFT.
- **Wallet:** the digital wallet holds NFTs and is used for transactions in the swapping process.
- **NFT Contract:** Smart Contracts associated with NFTs, including those that are immutable, upgradeable, new, capable of owning another NFT, represent real-world assets (phygital), have yield, or bring additional value or utility (e.g., exclusive access or airdrops).
- **Blockchain/Network:** the underlying technology that facilitates the creation, existence, and trading of NFTs.
- **Holder:** entities owning NFTs who participate in swapping, including collectors and liquidity providers.
- **Marketplace:** platforms that facilitate the listing, viewing, and swapping of NFTs, including curators, galleries, and online marketplaces.

Detailed Description of Use Case/Scenario

Preconditions:

- At least one NFT is minted by Creator using System.
- Two or more Holders possess NFTs they are willing to exchange.
- Each Holder has verified the authenticity and ownership of the other Holders' NFTs.
- A Platform or Marketplace exists to facilitate the swap.

Main Flow:

1. **Initiation:** a Holder initiates the swap by listing an NFT for exchange, specifying value or desired types or specific NFTs for swapping.
2. **Discovery and Agreement:** another Holder discovers the listing and agrees to the swap terms, either through direct negotiation or via automated match-making facilitated by Smart Contracts on the Platform.

3. **Smart Contract Execution:** upon agreement, a Platform Smart Contract is initiated, encapsulating the terms of the swap. This contract ensures that the exchange is executed only if both parties meet the agreed conditions.
4. **Validation and Swap:** the Platform validates the ownership of the NFTs, temporarily locks them to prevent other transactions, and executes the swap through the Smart Contract.
5. **Confirmation and Transfer:** upon successful validation, the NFTs are transferred between the Holders' Wallets. The Blockchain records the transaction, ensuring transparency and non-repudiation.
6. **Royalties:** Platform and System distribute royalties to Creator, paid by one or both Holders.
7. **Post-Exchange:** each Holder now owns the NFT initially held by the other party. They can verify the transfer through their wallet and the transaction history on the Blockchain.

Alternative Flow

- **Failed Validation:** if the Platform detects issues with the NFTs (e.g., one party attempting to swap someone else's NFT), the Smart Contract halts the swap, and the assets remain with their original owners.
- **Cancellation:** either party may cancel the swap before the Smart Contract execution if the platform allows. Cancellation after contract initiation may require mutual agreement or result in penalties as defined by the contract.

Postconditions

- Both parties have successfully exchanged their NFTs.
- The Blockchain provides a transparent record of the swap, ensuring trust and security in the transaction.
- Royalties on the exchange are paid to Creator.

Implementations and Demonstrations or Technical Feasibility

Examples of Rent Platforms:

- OpenSea
- Rarible
- SuperRare

Challenges:

- **Royalty payment:** creating fair compensation for Creator when no fungible tokens are used in the swap.
- **Valuation and Fair Exchange:** determining the fair value of NFTs to be swapped can be challenging due to the subjective nature of digital art and collectibles, market volatility, and the uniqueness of each NFT.
- **Smart Contract Complexity:** ensuring the Smart Contracts that facilitate the swap are secure, efficient, and execute as intended, considering the variety of NFT standards and functionalities (e.g., ERC-721, ERC-1155).

- **Interoperability Between Blockchains:** swapping NFTs across different blockchain platforms can introduce technical challenges due to varying standards, protocols, and Smart Contract languages.
- **Fraud and Security:** mitigating risks related to fraudulent NFTs, ensuring the authenticity of the assets being swapped, and protecting against potential security vulnerabilities in the swapping process.
- **Regulatory and Legal Compliance:** navigating the evolving legal landscape around digital assets, intellectual property rights associated with NFTs, and ensuring compliance with regulations across jurisdictions.
- **User Experience and Accessibility:** creating a seamless and intuitive swapping experience for users, regardless of their technical expertise, and ensuring the process is accessible to a broad audience.
- **Privacy Concerns:** safeguarding the privacy of users participating in NFT swaps, especially in light of public transaction records on blockchains.
- **Environmental Impact:** addressing concerns related to the energy consumption and carbon footprint associated with blockchain transactions, including those for NFT swapping.

Requirements:

Technical and Functional Requirements:

- **Smart Contract Security:** robust security measures to prevent exploits and ensure the integrity of the swap transactions.
- **Standardization of NFT Metadata:** uniform standards for NFT metadata to facilitate interoperability across different platforms and blockchains.
- **Cross-Blockchain Compatibility:** mechanisms for seamless NFT swapping across different blockchain networks, including bridges and interoperability protocols.
- **User Authentication and Authorization:** secure and user-friendly methods for authenticating and authorizing users to prevent unauthorized transactions.

Interoperability Requirements:

- **Interoperable NFT Standards:** adoption of widely recognized NFT standards (e.g., ERC-721, ERC-1155) to ensure compatibility and ease of swapping.
- **Decentralized Identity Verification:** implementation of decentralized identity solutions for verifying participant identities across platforms without compromising privacy.

Other Key Considerations:

- **Privacy:** ensuring user data privacy and confidentiality throughout the swapping process.
- **Cybersecurity:** implementing comprehensive cybersecurity measures to protect against hacking, fraud, and other security threats.
- **Identity:** secure and privacy-preserving mechanisms for establishing and verifying user identities.
- **Networking and Latency:** optimizing network protocols and infrastructure to minimize latency and ensure swift transaction processing.

- **Ownership:** clear and immutable recording of ownership changes on the blockchain to prevent disputes.
- **Digital Ethics:** consider the ethical implications, including the need for transparency in transactions and equitable access to swapping mechanisms.
- **Provenance:** tracking and verifying the history and authenticity of NFTs to ensure trustworthiness.
- **Accessibility:** designing interfaces and processes that are accessible to users with varying levels of technical expertise and disabilities.

Relevant Domain Working Group (WGs):

- NA

Relevant Pre-qualified Organizations and Groups (POGs):

- NA

Relevant Specifications, Publications and Projects (SPPs):

- NA

Related Use Cases

- NFT Internal Transfer Use Case (MSF2024-001-NFTIWT) except that the parties that own the wallets are different and NFTs are swapped rather than transferred.

Additional Comments

- This document is a living artifact and may be subject to revisions on a periodic basis to reflect the future state of NFT Royalties, and or based on feedback received from MSF stakeholders that warrants an update in the future.