METAPLEX

A Decentralized Protocol for Digital Assets

The Metaplex Foundation

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Overview

Metaplex is a decentralized protocol trusted for the creation, sale and use of digital assets on the Solana blockchain.

Since launching in August 2021, Metaplex has been used to mint over 20 million NFTs with over 5.9 million unique collectors, accounting for over 99.9% of the Solana NFT market. This makes Metaplex the largest protocol in the Solana ecosystem and the primary driver of new users.

Metaplex assets now underpin a multi-billion dollar economy, having facilitated over $3.5 billion USD in primary and secondary sales. Over $990 million of this commerce has transacted directly through the Metaplex Protocol, driven by programs such as Token Metadata, Candy Machine and Auction House.

The Metaplex Protocol has four components.

First, the Digital Asset Standard (DAS) defines the schemas, behaviors and system architecture for various digital asset types, and supports use cases in art, collectibles, gaming, identity, music and more.

Second, the Metaplex Program Library (MPL) provides an on-chain Solana implementation of the Digital Asset Standard for applications to create, sell, buy and use these assets.

Third, the Metaplex Developer Platform provides Developer Tools and SDKs to streamline working with the MPL. These tools have accelerated widespread integration of Metaplex in products like Phantom, OpenSea, Fractal, Magic Eden, FTX and soon Instagram.

Fourth, $MPLX is the utility and governance token for the Metaplex Protocol. Token holders steer the direction and evolution of the protocol through the Metaplex DAO, delivering on the promise of a decentralized and community-owned creator platform.

Digital Asset Standard

The advent of the Solana NFT ecosystem required the creation of a metadata standard to facilitate the interoperability of digital assets between applications: a necessary precondition for an open and liquid ecosystem.

In the same way that the Ethereum ecosystem coalesces around the ERC-721 and ERC-1155 standards, the Solana NFT ecosystem has fully aligned around the Metaplex Digital Asset Standard. Virtually all Solana NFTs are Metaplex NFTs because they are deployed with this standard and minted with the Metaplex Program Library, and therefore benefit from built-in liquidity access from the time of minting.

Relative to Ethereum, Metaplex's stewardship of the Solana NFT standard gives the Solana NFT ecosystem a key advantage, as there is a protocol and community dedicated to innovating at the standards layer for the benefit of creators, collectors and developers.

At a glance, the key features of the Digital Asset Standard include:

- Structured and composable schema definitions for digital asset components (e.g., images, configurable royalty percentages, collections)
- Composable NFT behavior definitions such as metadata mutability, NFT transfer semantics, compression and authority management
- Flexible storage options, on-chain and off-chain
- Standards and reference implementations for off-chain indexing and performant querying
- Compatibility with ERC-721 via bi-directional bridging with Wormhole Network

The Digital Asset Standard has three major components:

1. Asset type and schema definitions
2. Behavior and lifecycle event definitions
3. System architectural component conventions

Asset Types & Schemas

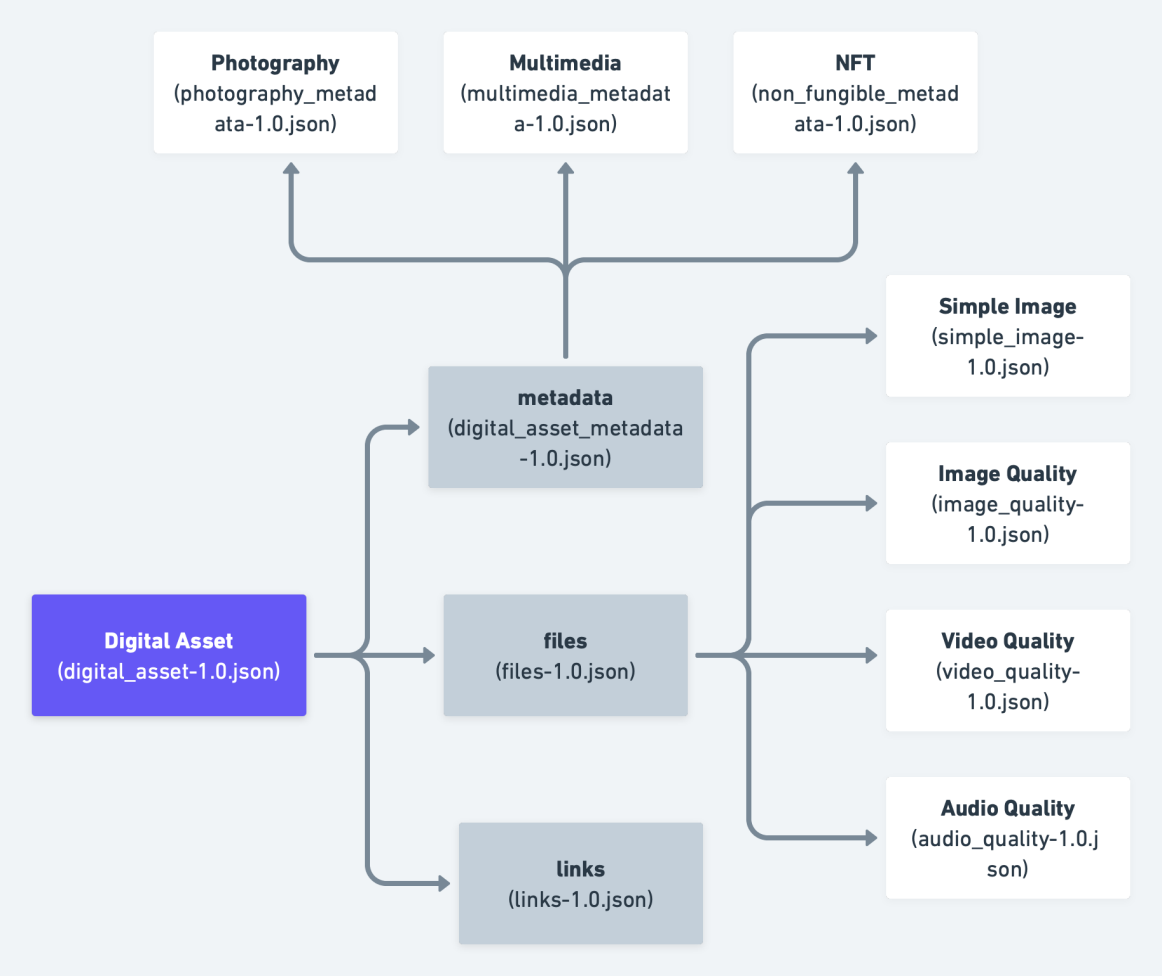
Today, the Digital Asset Standard supports the following asset types with schemas applicable to each type:

Non-Fungible Token	A SPL Token with a Master Edition Account that limits supply to 1
Fungible Asset	A token with metadata that can also have attributes, sometimes called Semi-Fungible
Fungible Token	A token with simple metadata
Non-Fungible Edition	A non-fungible token with an Edition account (printed from a Master edition)

The current core metadata schema upon which other standards or schemas may be built is described below:

Field	Type	Description
name	string	Name of the asset
symbol	string	Symbol of the asset
description	string	Description of the asset
image	string	URI pointing to the asset's image
animation_url	string	URI pointing to the asset's animation
external_url	string	URI pointing to an external URL defining the asset — e.g., the game's main site
attributes	Array< {trait_type, value}>	Array of attributes defining the characteristics of the asset

The schemas are designed to scale in a composable way with extensions, as described in the current Digital Asset Standard improvement RFC. The example below illustrates a core schema along with a set of sub-schemas which, when combined, form the final schema for a specific digital asset.



Example of Schema and Sub-schema Architecture

Behaviors

The Digital Asset Standard specifies a set of behaviors that mutate the state described by the schemas. The core supported behaviors are as follows:

- **Construction** - create (mint), update, burn
- **Ownership** - transfer, freeze, thaw, delegate
- **Supply** - increase supply, decrease supply

Extensions to behaviors that depend on the core behaviors optionally may be specified and may depend on specific schema extensions to function. Examples include:

- **Financial** - list, offer, sell
- **Compression** - compress, decompress
- **Composability** - split, combine

System Architecture Conventions

The Digital Asset Standard specifies conventions for indexing and querying digital assets as well as reference implementations for each. Metaplex will continue to publish additional conventions and/or reference system architectures to drive the ecosystem forward.

With respect to storage, although the Digital Asset Standard supports any off-chain provider for the storage of media and assets, most projects choose to use one of the following services:

- Arweave
- IPFS (via NFT Storage)
- S3
- Shadow Drive

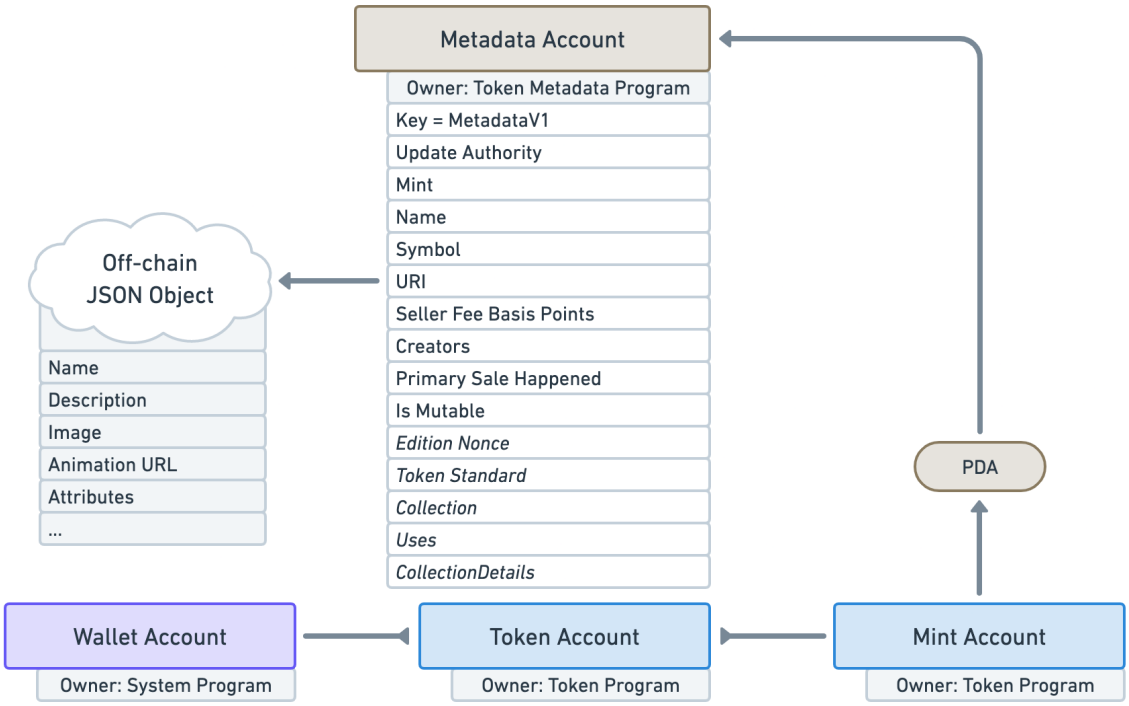
Metaplex Program Library (MPL)

Implementing the Digital Asset Standard on Solana, the Metaplex Program Library (MPL) provides developers with on-chain utilities for building NFT, metaverse, and gaming applications. The MPL includes solutions for every node in the digital asset supply chain, including creation, primary sales, secondary sales and utility programs. Below is the current set of Solana programs in the library, all of which are open source and available on GitHub.

Token Metadata

The Token Metadata program facilitates the creation and use of digital assets. An NFT minted with Token Metadata costs 0.012 SOL, which is the total amount of SOL needed for blockchain rent and to process the necessary on-chain Solana transactions.

At its core, the Token Metadata program attaches an on-chain metadata account to an SPL-token mint and contains data that conforms to the schemas specified by the Digital Asset Standard. In order to minimize the cost of minting, the on-chain metadata may reference off-chain metadata. The diagram below describes the relationship between the various Solana accounts.



Within Token Metadata, there are many instructions that provide the core composable behaviors specified in the Digital Asset Standard and can be broadly broken out into the following categories:

- Create, update, burn asset metadata
- Freeze and thaw assets
- Manage and verify creator royalties
- Manage and verify asset collections
- Manage programmatic authority over assets
- Define asset composability via token owned escrow

A full list can be found in the documentation and the code.

Compression

Metaplex provides industry-low minting fees through Token Metadata (0.012 SOL), and with the addition of compression for NFTs, NFTs can be minted for as little as the cost of a single Solana transaction. Solana rent costs scale sub-linearly, with the number of compressed NFTs minted allowing creators and builders to reduce their costs to ~6 SOL for 1 million NFTs and ~50 SOL for 100 million NFTs.

The Metaplex Foundation's NFT compression program (Bubblegum) utilizes Solana's concurrent Merkle tree program (Gummyroll) to hash NFT metadata into off-chain Merkle trees. This is supplemented by off-chain indexers that observe modifications of the tree via the ledger (e.g., Metaplex's Digital Asset Validator Plugin) and serve the proofs and data needed for dApps and smart contracts to interact with compressed NFTs.

Compressed NFTs maintain backwards-compatibility with uncompressed NFTs and can be transferred, delegated, and even decompressed for interoperability with existing smart contracts. Compression makes Metaplex metaverse-ready by fostering new hyperscale use cases such as games and Web2-to-Web3 experiences that would otherwise be cost-prohibitive.

Candy Machine

The Candy Machine program is the predominant method used to create and launch collections of Solana NFTs, such as profile picture (PFP) projects like DeGods, Shadowy Super Coder, and Degenerate Ape Academy. Candy Machine allows collectors to easily mint a random NFT from a generative collection with varying rarity and traits which are stored as metadata in the NFT. Candy Machine has facilitated over $940 million in primary sales for creators and accounts for over 70% of all NFT mints on Solana at the time of writing.

Candy Machine currently supports many configuration options including:

- Token gated minting (token allow list)
- Wallet address gated minting (wallet allow list)
- Demand based pricing
- Freezing NFTs (i.e. cannot be listed on a marketplace) until a specific time in the future or the collection is minted out, whichever is sooner
- Payment in tokens other than SOL including NFTs as payment

With the upcoming Candy Guard architecture, creators and developers have a flexible system to build custom functionality into their NFT launches without needing to modify the core Candy Machine contract.

Auction House

Auction House is a peer-to-peer escrowless commerce program for buying and selling NFTs, trusted by the majority of Metaplex NFT marketplaces, such as OpenSea, Rarible, Fractal and Holaplex. The program achieves escrowless listings by utilizing token authority delegation, allowing the listing marketplace as well as 3rd parties to execute sales when a listing matches a bid. During the sale, the buyers receive their NFT, the sellers receive their payment, the creators receive their royalties and the marketplace receives their fee, all in a single transaction.

Auction House supports many scenarios, from fully decentralized markets to more centralized markets that prefer to allow specific NFTs to be bought and sold. These features include:

- Timed auctions
- Partial order fulfillment
- Dynamic pricing
- Requiring sign off for sale transactions

The Auctioneer architecture allows marketplaces using Auction House to add their own custom trading logic such as watching external oracles or requiring extra signers on the “execute sale” transaction. The methods that a custom Auctioneer can control are:

- Buy
- Public Buy
- Sell
- Execute Sale
- Cancel
- Deposit
- Withdraw

Gumdrop

The Gumdrop program uses Merkle trees to facilitate airdrops to a large number of whitelisted users at a low cost to creators. To date, over 268,000 users have received NFTs via whitelist tokens distributed through Gumdrops.

Various ecosystem projects desire to ensure that early followers and supporters gain access to project assets, whether tokens, NFTs, or others. Simultaneously, capitalization of these assets should not incur undue costs or operational overhead to the creators.

Gumdrop solves this efficient-airdrop issue by utilizing a space-efficient hash structure (the Merkle tree) so that an on-chain program can validate whether the user is part of a whitelist. This uses a pull-based paradigm to shift the burden from creators, sending airdrops or pre-minting NFTs, to recipients who can choose to claim their portion or leave it for general adoption.

Moreover, Gumdrop allows creators to directly send whitelisted users a drop reclamation link by building the tree with off-chain handles (e.g email, Discord, etc) and allowing the user to redeem into any wallet.

Hydra

Hydra is a wallet of wallets; aka a fanout wallet. It enables extremely large membership sets that can take part in efficient fund distribution from a central wallet with varying weight configurations. Memberships can be defined by:

- Wallet address list
- Ownership of a specific token
- Ownership of specific NFTs

A major advantage of using Hydra for fund distribution is that users are no longer required to stake their assets in order to receive rewards or distributions and may use those unstaked assets freely across many different applications at once.

NFT Packs

The NFT Packs program supports the creation of packs of NFTs that are not revealed until after opening, similar to purchasing a pack of baseball cards at the store or a “gacha” within a game. This is a common game mechanic that allows a pack to freely trade in an unopened state, alongside markets for the individual items that are revealed.

Fixed Priced Sale

The Fixed Priced Sale program is used to create and launch collections of print edition NFTs. The sales are configured to be either limited editions or open editions and accept SOL or any SPL token. Use cases include community membership tokens, digital art and collectibles.

Token Entangler

Token Entangler entangles two NFTs together so only one can exist in the wild at a time (and can always be exchanged with the entangled NFT). This can be useful to 'de-rug' projects by replacing all the rugged NFTs with a new non-rug set.

Developer Platform

The Metaplex Developer Platform facilitates the use of Metaplex Program Library and the Digital Asset Standard, providing SDKs, developer tools and reference user interfaces. In addition to Metaplex-specific tooling, generalized Solana community tooling has been developed and open-sourced to accelerate the growth of the entire ecosystem.

With over 6.6k forks and 3.2k stars on Github, these tools have become a key utility for Solana developers, and as a result, the Metaplex Github has become one of the most popular repositories in the world for blockchain development and Rust programming.

SDKs

The Metaplex SDKs are libraries that allow you to load and deserialize accounts, create transactions, and interface programs (mint NFT, create an auction, and so on). The current supported languages are:

- JavaScript/TypeScript (node.js and browser)
- iOS
- Android
- Python

Developer Tools

Metaplex has released a collection of tools to interact with the Metaplex Program Library as well as tools to accelerate general Web3 software development. The tools include:

- Sugar: A Rust Command Line Interface (CLI) for creating, configuring and launching Candy Machines.
- Solita: A set of tools for easily generating TypeScript and Swift clients to Rust programs via annotation
- Amman: A framework for easily testing and inspecting Solana SDK libraries and apps on a locally running validator.
- Shank: Shank makes it possible to extract IDLs from Rust Solana program code annotated with Shank attribute macros. This IDL can then be fed to Solita in order to generate low level TypeScript SDK for that particular Rust program.
- Beet: Strict borsh compatible de/serializer and related extensions. Beet is used by Solita to improve type safety. The Solana specific extension package, @metaplex-foundation/beet-solana, adds new features such as GPA builders due to Beet's knowledge of account layouts.
- Cusper: Cusper resolves Custom Program Errors from Solana program logs or error codes. It is used by Solita to make dealing with program errors significantly easier.
- Rust Bin: Synchronizes a Rust binary version with the related Rust crate.

- Gumdrop CLI: A JavaScript tool for creating, configuring and launching Gumdrops

Guides & Reference UIs

The collection of reference UIs provide working examples of how to build full or partial applications on top of the Metaplex Program Library.

- Candy Machine UI: A reference app for minting NFTs from the Candy Machine program that can be created and configured via Sugar or directly by interacting with the on-chain Candy Machine Program.
- Gumdrop: A reference app for creating, configuring and claiming tokens from the Gumdrop program.
- iOS Sample App: A reference iOS app for browsing Solana NFTs using the iOS SDK
- Android Sample App: A reference Android app for browsing Solana NFTs using the Android SDK

$MPLX Token

To support a growing NFT ecosystem, the Metaplex Foundation released $MPLX,a multifaceted governance and utility token that serves as the native token for the Metaplex Protocol and an open metaverse.

The Solana address for $MPLX is: METAewgxyPbgwsseH8T16a39CQ5VyVxZi9zXiDPY18m

Governance

$MPLX coordinates governance and upgrades to the Metaplex Protocol. Holders of $MPLX may use it to vote in the Metaplex DAO, an on-chain program built on the governance framework provided by the Solana Program Library.

$MPLX tokens give holders the right to vote on issues that govern the development and operations of the Metaplex Protocol, such as:

- Protocol development roadmap
- $MPLX utility roadmap
- Use of treasury funds
- Protocol ownership, upgrades and deployment
- Resolving emergency and other unpredictable issues

The introduction of a new program into the MPL first requires that the new program receive an 'experimental status' designation, during which time the Metaplex Foundation holds authority over the program. The Foundation administers community-driven bug bounties and formal audits during this phase. Once this period has completed, $MPLX holders may be presented with proposals to bring a program under the full authority of the DAO, and after such proposals are approved, future modifications will be solely made at the discretion of $MPLX holders.

In addition, proposals for specific modifications of MPL programs may also be presented to the DAO, regardless of whether or not the program has been brought under the authority of the DAO.

$MPLX holders also control the Metaplex DAO treasury, which at inception held 200 million $MPLX tokens. $MPLX holders will vote on a proposal to airdrop 40 million $MPLX out of the treasury to collectors of Metaplex NFTs, as further described in the next section.

Utility

In addition, $MPLX facilitates the interaction of marketplaces, developers, creators and other Metaplex ecosystem members. For example, as an initial foray into $MPLX potential use cases, the Metaplex DAO may release NFTs and

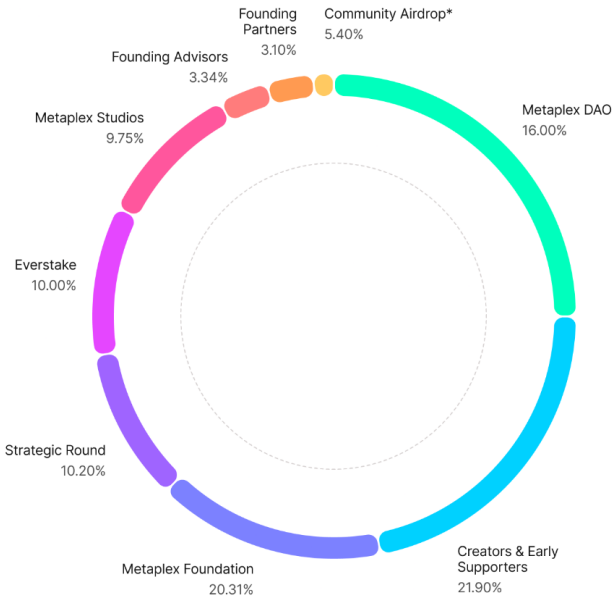
other digital assets accessible only to $MPLX holders. To illustrate this capability, the Metaplex DAO released this whitepaper itself as a limited collection of 1,000 NFTs, with artwork from Contrastive.

As the Metaplex Protocol expands, $MPLX holders, as governors of the DAO, may evaluate further ways to integrate $MPLX into the functionality of the protocol such as payment, staking or more. We also encourage builders within the Metaplex ecosystem to incorporate $MPLX into their own projects. $MPLX will serve as an essential conduit between the protocol and the broader Metaplex community, and between community members.

$MPLX token holders are not entitled to any underlying claims on the assets, economic rights or cash flows generated by the Metaplex Protocol.

Distribution

The total supply of $MPLX is 1 Billion (1,000,000,000) tokens, distributed as follows:



Metaplex DAO	16.00%
Creators & Early Supporters	21.90%
Metaplex Foundation	20.31%
Strategic Round	10.20%
Everstake	10.00%
Metaplex Studios	9.75%
Founding Advisors	3.34%
Founding Partners	3.10%
Community Airdrop*	5.40%

*4.0% collector airdrop subject to DAO vote

Creators & Early Supporters - 219,000,000 $MPLX (21.90%)

Metaplex would not exist without the dedication from our early supporters and creators. Tokens were sold in an early financing round to key contributors who worked to build the ecosystem, and will serve as ongoing partners in the development and growth of the community.

Creator & Early Supporter tokens are subject to a delivery schedule pursuant to which 50% of each participant's tokens will be delivered 1 year from the first token airdrop (September 19, 2022), followed by delivery of the remaining 50% in the following year, on a monthly pro-rata basis.

Metaplex DAO - 160,000,000 $MPLX (16.00%)

The Metaplex DAO is used for protocol changes, ecosystem grants, and strategic initiatives. Tokens held by the DAO are subject to $MPLX governance - distributed through proposals from community members. The Metaplex DAO initially held 200 million $MPLX, and a proposal was submitted to airdrop 40

million $MPLX from the Metaplex DAO treasury to collectors who were heavy minters or early adopters of Metaplex NFTs.

Metaplex DAO tokens are not subject to vesting and are immediately usable.

Metaplex Foundation - 203,057,143 $MPLX (20.31%)

The Metaplex Foundation will administer the ongoing community-driven growth of the Metaplex ecosystem. This may include hiring, funding and grants - these programs are meant to provide more flexibility to growth initiatives in harmony with the broader Metaplex DAO.

Foundation tokens are not subject to vesting and are immediately usable.

Strategic Round - 102,042,857 $MPLX (10.20%)

Used to align Metaplex with strategic capital providers as well as pop culture, entertainment, sports and cultural leaders to advocate for Metaplex and the growing role of NFTs in the broader economy.

Strategic Round tokens are subject to a delivery schedule pursuant to which 50% of each participant's tokens will be delivered 1 year from the first token airdrop, followed by delivery of the remaining 50% in the following year, on a monthly pro-rata basis.

Everstake - 100,000,000 $MPLX (10.00%)

Everstake, a tenured development shop and renowned Solana staking service, was one of the founding development teams behind the Metaplex Protocol and the launch partner to the Metaplex Foundation. They have been a crucial contributor to the Solana ecosystem. They are advisors to the community and have provided engineering support as seasoned Solana developers.

Everstake tokens are subject to a 2 year cliff and a 1 year linear vest thereafter.

Metaplex Studios - 97,500,000 $MPLX (9.75%)

Metaplex Studios is a key member of the Metaplex community. Metaplex Studios exists to accelerate the development of the Metaplex Program Library and Digital Asset Standard via protocol development, developer tool creation, commercial partnerships, community support and first-party app development.

Metaplex Studio tokens are subject to a 1 year cliff and a 2 year linear vest thereafter.

Community Airdrop - 54,000,000 $MPLX (5.40%)

On April 29, 2022, the Metaplex Foundation offered the Genesis Developer NFT to developers who contributed to the Metaplex Protocol. On September 19, 2022, the Metaplex Foundation allocated 0.8 million $MPLX to airdrop to the holders of the Genesis Developer NFT (the Developer Airdrop). Due to the non-transferability of the Genesis Developer NFT and the exclusion of US developers from receiving the Genesis Developer NFT, US persons were geo-blocked from receiving the Developer Airdrop.

Also on September 19, 2022, the Metaplex Foundation allocated 13.2 million $MPLX to airdrop to the creators who have launched NFT projects using Metaplex (the Creator Airdrop). US persons were geo-blocked from the Creator Airdrop.

Finally, on the same day, a proposal was submitted to the Metaplex DAO to airdrop 40 million $MPLX from the Metaplex DAO treasury to collectors who were heavy minters or early adopters of Metaplex NFTs (the Collector Airdrop). US persons will be geo-blocked from the Collector Airdrop as well. $MPLX holders, which at this point include recipients of the Developer Airdrop and the Creator Airdrop, have been asked to vote on and approve the Collector Airdrop.

In total, 54mm $MPLX, or 5.4% of all $MPLX tokens, are available for the community airdrop, subject to the DAO vote on the Collector Airdrop. US persons were geo-blocked from receiving any of the airdropped tokens, and all wallets receiving airdropped tokens were evaluated for anti-communal behavior (e.g., bots, scams and rug pulls) prior to those wallets receiving any tokens.

Airdrop tokens are not subject to vesting and are immediately usable.

Founding Advisors - 33,400,000 $MPLX (3.34%)

The Founding Advisors advocate for Metaplex to creators and developers in Web3 and beyond. These teams and individuals have been instrumental in the launch of Metaplex and will be long term advocates for the growth and expansion of the ecosystem.

Advisor Grants are subject to a 1 year cliff and a 1 year linear vest thereafter, and a 1 year lock-up period from the first token airdrop.

Founding Partners - 31,000,000 $MPLX (3.10%)

The Founding Partners are early supporters and partners of the Metaplex Protocol. They launched some of the first storefronts, and continue to be a sounding board for additions to the program library, NFT standard and developer tools.

Partner Grants are subject to a 1 year cliff and a 1 year linear vest thereafter, and a 1 year lock-up period from the first token airdrop.

Ecosystem

Metaplex is the fastest growing NFT ecosystem in the world with over 2.4 million wallets currently holding a Metaplex NFT and over 5.9 million wallets having ever held one. Thousands of NFT communities, games, marketplaces, utility programs and wallets are built on Metaplex's developer platform, creating deep network effects for the protocol that are sustaining growth even through a severe bear market.

NFT Communities

As of writing, there are over 90,000 collections that have been created with Metaplex, most of which represent emerging crypto-native communities that use NFTs and "Profile Picture" (PFP) art to organize online. Communities like DeGods, Solana Monkey Business and the Degenerate Ape Academy are not just delivering "Art & Collectibles"; they are fundamentally re-orienting the model for social networking. Instead of your identity living in the database of an ad-funded corporation, in an NFT community, your identity is a self-custodied asset on a censorship-resistant blockchain.

While the technology is in its earliest stages, communities are already forming around a diverse range of values, goals and affinities. For example, Shadowy Super Coder DAO is a community run by GenesysGo, which provides one of the largest RPC networks on Solana. Communities like Belugies and Honey Badges focus on charitable causes, while Stoned Ape Crew and Best Buds organize cannabis enthusiasts, technologists and policy advocates.

The "floor price" is a common success metric for these communities and represents the economic value to join as a community member. As of writing, there are over 110 communities with a market value of over $1 million USD and over 367 collections with a floor price above 50 SOL.[1]

The total market cap of all Metaplex NFTs is close to $1 billion USD, making Metaplex NFTs the second largest NFT ecosystem by market cap after Ethereum NFTs.[2] In just one year, Metaplex is approaching the same number of all-time unique NFT collectors as Ethereum (5.9 million vs. 6.1 million), demonstrating the ecosystem's rapid growth.[3]

Games

With over $4 billion in capital investment in 2021 and $5 billion in the first half of 2022 alone, blockchain gaming is one of the fastest growing technology

[1] Hyperspace - Top NFT Projects
[2] Hyperspace - Top NFT Projects
[3] Dune Analytics

sectors in the world, fueled by innovations in NFTs and digital assets.[4] Within the Solana ecosystem, FTX, Lightspeed and Solana Ventures have raised $100 million to invest in blockchain gaming.[5] This was followed shortly by Forte, Griffin and Solana Ventures committing another $150 million to invest in the space.

Metaplex, leveraging the industry-leading cost performance and speed of the Solana blockchain, is well positioned to become the ubiquitous platform for this next generation of games and metaverse experiences. Aurory, Nyan Heroes, Star Atlas, Panzer Dogs, Mini Royale and STEPN, are leading the charge, inventing new engagement models that leverage digital asset experiences built with Metaplex.

Marketplaces

There are several significant marketplaces where collectors can buy and sell Metaplex NFTs, all of which have chosen Metaplex to power key components of their businesses.

Marketplace	Digital Asset Standard	Candy Machine	Auction House	Collections
OpenSea	Yes	Yes	Yes	Yes
Rarible	Yes	N/A	Yes	Yes
Magic Eden	Yes	No	No	No
FTX	Yes	N/A	No	No
Hyperspace	Yes	Yes	No	No
Fractal	Yes	Yes	Yes	Yes
Holaplex	Yes	N/A	Yes	Yes
Exchange.art	Yes	N/A	No	Yes
FormFunction	Yes	N/A	No	Yes
Solanart	Yes	Yes	Yes	No
ChapterX	Yes	N/A	Yes	Yes

[4] DappRadar x BGA Games Report – Q2 2022
[5] Solana Ventures, Forte, Griffin invest $150 million in blockchain gaming | Reuters

Utility Protocols

As creators and developers explore the vast set of use cases for digital assets, several utility protocols have emerged that are built on the Metaplex Protocol and Standard.

- Cardinal Protocol provides extended functionality for the rental, subscription and staking of Metaplex NFTs.
- Solvent provides liquidity pools for Metaplex NFTs.
- Raindrops establishes a framework for gaming assets that extends Metaplex, with game-specific schema definitions and on-chain utility programs.
- Cupcake provides a framework for physically redeeming NFTs from NFC tags, opening up new use cases in fashion and retail.
- xNFTs ("executable NFTs") provide a new model for software distribution with tokenized code representing ownership rights over its execution.

Live Events

In 2021, Live Nation took its first step into the NFT space by partnering with Metaplex at Lollapalooza to provide exclusive collectibles and art to festival attendees. Live Nation followed this successful activation with a similar program in 2022. Coachella also introduced its first NFT experience in 2022, launching three separate collections and an IRL experience for festival goers built with Metaplex.

Wallets

All major Solana wallets, including Phantom, Solflare, Slope and Glow, support the viewing, receiving and sending of Metaplex NFTs.

RPC Providers

The leading Solana RPC providers that serve NFT queries in a performant fashion have made custom modifications to their tech stack to support the rapid growth of Metaplex NFTs on the Solana blockchain. These include Triton, GenesysGo, Alchemy and Quicknode.

Closing Thoughts

As the fastest growing NFT ecosystem in the world, Metaplex is in a unique position to underpin and catalyze the next generation of crypto native communities, blockchain applications, and games that will onboard the first billion users to Web3.

The Metaplex community is stronger than the sum of its parts and bound by a shared vision to build a platform that is owned and governed by the creators, developers and collectors that contribute to it. We welcome contributors to this vision who are eager to write code, launch projects, build protocols or participate in governance through the Metaplex DAO.

A sincere thanks to the 168 contributors on Github that have built the Metaplex Protocol from the ground up, and a special thanks to Sergey Vasylchuk, Kyryl Shyian, Nhan Phan, Austin Adams, Bartosz Lipinski, Jordan Prince, Adam Jeffries, Prashant Rai, Dorian Lee, Jules Mossler, Anatoly Yakovenko, Raj Gokal, Ben Sparango, Austin Federa and Stephen Hess for their significant contributions.