

OriginTrail Ecosystem White Paper 2.0

“Things are only impossible until they're not.”

– Captain Jean-Luc Picard.

Authors:

Trace Labs - OriginTrail core developers

Contributors:

Trace Alliance Working Group on Tokenomics and Decentralization

April 8, 2022

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Introduction

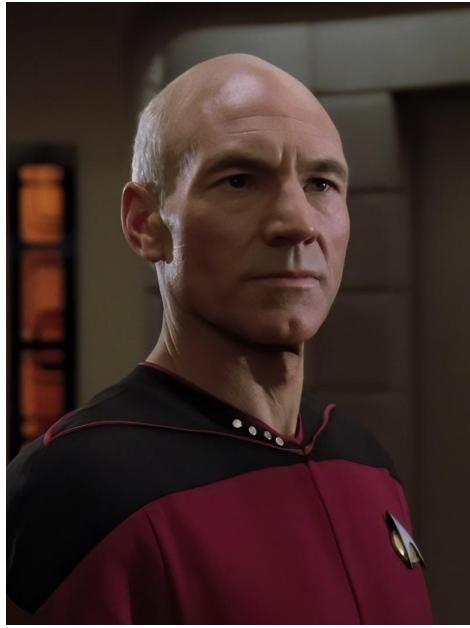
Five years since the inception of the OriginTrail Decentralized Knowledge Graph (DKG) concept in the [first white paper](#), the community saw tremendous progress as the OriginTrail Decentralized Network (ODN) came to be and was put to use for some of the most essential human activities – supply chains. The OriginTrail ecosystem, defined by the core values of neutrality, inclusiveness, and usability developed a unique character driving positive impact in collaboration with world-class partners.

For the first time ever, some of the most valuable information exchanges started to take place in a permissionless, trusted, and secure manner, while all network participants retained **sovereignty over ownership of data**, with value distributed in accordance with the OriginTrail protocol design.

OriginTrail brought a **scalable, trusted, and secure way for information to be shared** across a universe of data sources, bringing together users that were traditionally not able to perform data management in such a way. Validation of OriginTrail fundamentals in the real world in the advent of Web3 was instrumental in delivering the right technology coupled with the right ecosystem values.

As the OriginTrail adoption grew, and reliance on a single and often prohibitively costly Ethereum network started to show signs it might have hindered further expansion, the OriginTrail core development team proposed a phased approach towards integrating a **multi-chain strategy** to expand the capacity of the consensus layer.

The phase, originally named the ***Starfleet stage*** (inspired by the famous Star Trek series and its interplanetary organization for conducting deep space exploration, research, defense, peacekeeping, and diplomacy), soon yielded integrations with the so-called layer 2 blockchains, Gnosis and Polygon, which brought immense efficiencies in the consensus layer of OriginTrail technology stack.



“Things are only impossible until they're not.”

– Captain Jean-Luc Picard.

The Starfleet phase has finally come of age, as the OriginTrail ecosystem - led by the quest to develop the **world's first Decentralized Knowledge Graph** to make humanity's most important **assets discoverable, verifiable, and valuable** - reached the next frontier signifying the extraordinary progress that lies before us.

Having garnered awareness of the historical momentum brought by the development dynamics within our ecosystem and wider Web3 community alike, this white paper marks the beginning of the crucial progress stage at which OriginTrail becomes stronger by introducing its own, **DKG-specific layer 1** - the *OriginTrail Parachain*.

Envisaged to run on **Polkadot layer 0**, the **OriginTrail Parachain** brings a formidable capacity to incentivize the usage and growth of the DKG, huge efficiency gains without sacrificing decentralization, and network effects through interoperability with other parachains. The details of this new OriginTrail ecosystem component are outlined in this white paper.

1. Web3-grade assets and network effects

The third generation of the Internet, popularly referred to as **Web3**, offers an exciting opportunity to expand the way users interact with assets. Both assets, those anchored in the real world (cars, buildings, rare items such as an expensive bottle of whiskey, educational or vocational credentials, etc.) and those digitally native (NFTs representing digital art, gaming avatars, or fungible tokens used for trading) are poised to change the way we **manage, protect, and increase the value of our wealth**. Things we own are now **converging towards becoming Web3-grade assets** – assets made **discoverable, verifiable, and valuable** using the Internet technology comprising both a **semantic layer** – knowledge graphs and a **trust layer** – blockchain.

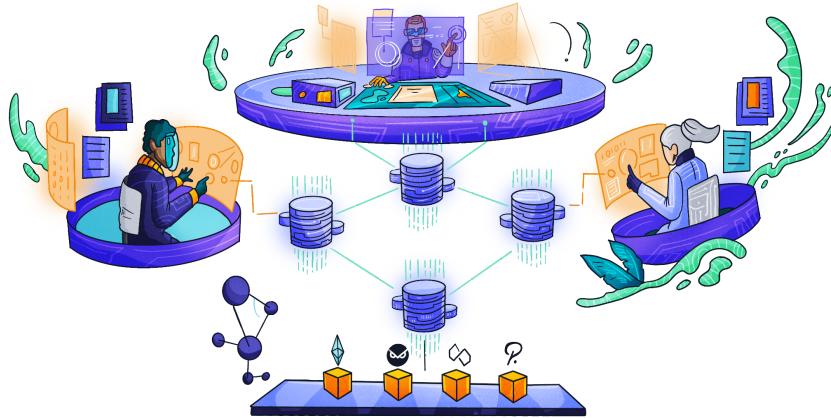
Leveraging both the groundbreaking knowledge graph and blockchain technology, **OriginTrail** is a **neutral, inclusive ecosystem** striving to deliver **useful and foundational Internet technologies**. The **open-source codebase** and **permissionless** nature of the established OriginTrail network layers drive transparency and laissez-faire type of market incentives that underpin the security, transparency, and antifragility of the system. OriginTrail is thus becoming a core component of Web3 infrastructure, also ensuring **user asset sovereignty** as data representing assets can only be managed by asset owners.



1.1 The network effects generated by the multi-chain OriginTrail Decentralized Knowledge Graph and the OriginTrail Parachain

Foundational technologies discussed in this white paper include the **layer 2 network** the ***OriginTrail Decentralized Knowledge Graph (DKG)*** with multi-chain capabilities (the DKG currently runs on three blockchains - Ethereum, Polygon, and Gnosis blockchains) and the **DKG-specific layer 1 blockchain** - the ***OriginTrail Parachain integrated with the Polkadot relay chain*** (operating as a layer 0 blockchain).

The Introduction of the OriginTrail Parachain as a **purposefully-built blockchain layer component** will drastically extend the groundbreaking capabilities of the existing **multi-chain DKG**.



The OriginTrail Parachain layer 1 network introduces **incentives for key user groups to further stimulate the growth of the number of assets connected in the DKG**.

The purpose of this volume of the white paper is to shed more light on the interaction between the multi-chain DKG and the purposefully built layer 1 blockchain, the OriginTrail Parachain, which will have both an immediate impact on the existing use cases and **harness network effects of the growing Polkadot ecosystem** and its domain-specific parachains ranging from:

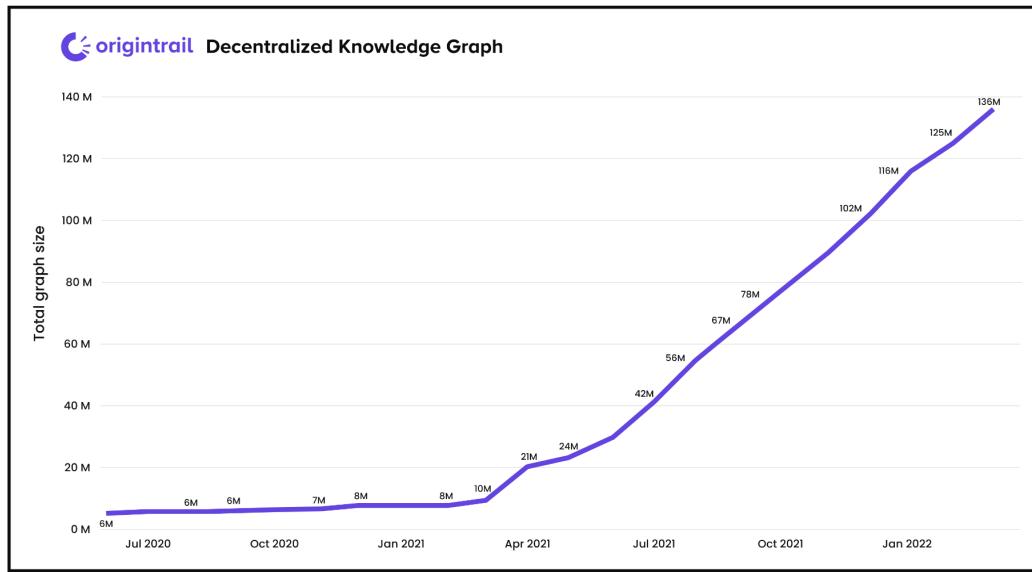
- Decentralized finance - DeFi (eg. [Acala](#)),

- Real-world asset collateralization (eg. [Centrifuge](#))
- Metaverse (eg. [Enjin](#), [Efinity](#))
- Ethereum and Bitcoin network bridges (eg. [Moonbeam](#))
- Internet of Things - IoT (eg. [Nodle](#), [Robonomics](#))

The OriginTrail Ecosystem growth is primarily based on [real-world adoption of Web3 technologies](#) with utility and is further spurred by the tokenomics design of both the OriginTrail DKG and OriginTrail Parachain, aligned in a way to leverage network effects by seamlessly integrating both network layers (more in the following chapters).

The use cases for the technology are diverse, yet specific applications already show a formidable footprint in the real world - one such example is the [SCAN Trusted Factory](#) system operated by a group of the largest US retailers and importers (eg. Walmart, Home Depot, Costco, etc.), which **helps secure some 40% of overall imports to the United States of America.**

The plethora of live applications is also reflected by the growth of the OriginTrail DKG network size, which at the moment of writing this white paper amounted to **136 million Total Graph Size (TGS)**. In short, the TGS counts the number of objects (also representing assets) and the connections between them.



Total Graph Size of the DKG – [Check the latest graph here](#)

Future growth will be possible at an even higher pace as the next version update of the OriginTrail DKG delivers over **500 times increase in network scalability** for handling asset data. It also introduces support for the innovative concept of ***Uniform Asset Locators (UALs)*** for asset discoverability across Web3, and several other important upgrades to the DKG tokenomics (UAI/UALs are introduced in more detail in more detail in the next sections of the paper).

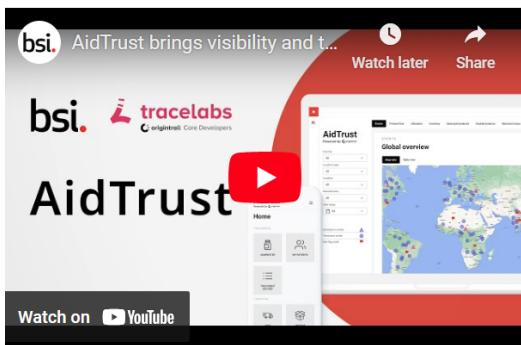
Moreover, OriginTrail prides itself on championing the real-world use of permissionless blockchain technologies for some of the most crucial sectors of human activity, protecting the integrity of assets we consume and rely on for our sheer survival - from food, clothing, luxury products, and commodities to medicaments, vaccines, verifiable credentials, and more.

Going forward, the OriginTrail ecosystem aims to facilitate network effects on several levels:

1. Leveraging strong OriginTrail ecosystem partnerships

(eg. British Standards Institution, SCAN, Trace Alliance, Oracle, World Economic Forum's Uplink, etc.) to further consolidate supply-chain-specific knowledge and put it to use in the Web3 realm.

[British Standards Institution OriginTrail implementations](#)



[Oracle Blockchain platform integration](#)



OriginTrail in the pharmaceutical industry

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Announcing AidTrust: visibility and trust in distributing donated medicines. From BSI and @TraceLabsHQ, AidTrust enables risk monitoring and real-time decisions, while retaining data integrity and security, on #medicines throughout the #Supplychain is bit.ly/3GHyBeT



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Ken McElroy - @HomeDepot: "It's been kind enough to partner with @BSI_UK & @origin_trail to take a circumstance where competitors in a marketplace are able to utilize #tech to provide value-added services to their organizations while maintaining the integrity of their #data." 🌟



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World Economic Forum partnership

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Using blockchain to source high-quality, vital PPE.

Discover more innovative solutions to the pandemic on UpLink: buff.ly/2O1nUoW @WEFUpLink @origin_trail



This start-up tracks medical supplies and PPE through the power of blockchain

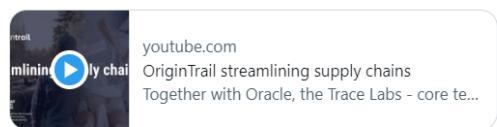
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Here's how #emeapartners @TraceLabsHQ - @Origin_Trail core developer - is successfully driving radical transparency & trust in food #supplychain with @ORCLblockchain : bit.ly/386NCbj @oracleemeaps



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Trace Alliance R&D of OriginTrail technologies

The screenshot shows a tweet from the account @Polkadot. The tweet reads: "@ParityTech is looking forward to working with the Trace Alliance to further our vision for a new internet where blockchains and trustless technologies foster new innovations and growth online. Our work on Polkadot is integral to this goal." — @FabianGompf. Below this, there is a reply from @origin_trail: "[ANNOUNCEMENT] @trace_alliance is happy to announce partnership with @ParityTech, the core development company of @Polkadot - a platform for Web 3.0 aiming to connect private and consortium chains, public and permissionless networks & oracles. bit.ly/parity-joins-t...". The tweet has 347 likes and 21 replies. A link to "Read 21 replies" is also visible.

2. Leveraging the OriginTrail DKG to create connections between users, assets, and keywords

(eg. connected ownership as demonstrated via the NFT Supercharger).

3. Leveraging the OriginTrail Parachain to enable cross-network (blockchain) interoperability driven by Polkadot's groundbreaking technology.

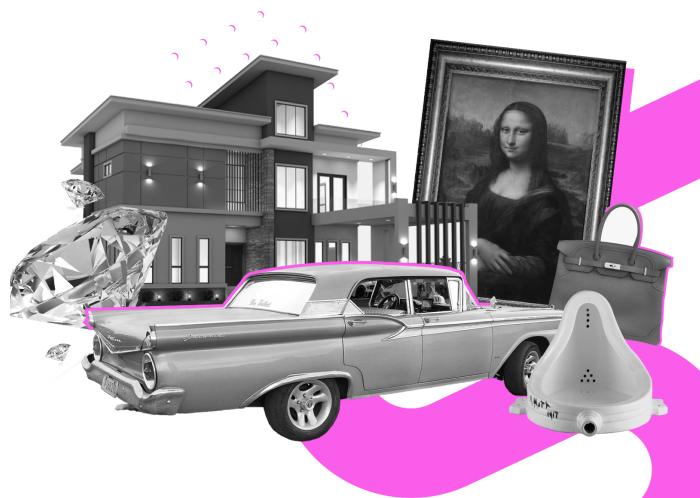
Advancements brought by the DKG-specific OriginTrail Parachain will drive use cases allowing for real-world items like cars, luxury items, houses, art, and other things and commodities we own to be turned into **Web3-native assets**. As they become Web3-native, another key advantage for real-world assets gets unlocked as we can expose them to all the exciting Web3 concepts that have been developed over the years.

One such example has been delivered by the Decentralized Finance (DeFi) movement which started with the dawn of the decentralized exchanges and evolved into many exciting directions. And as Polkadot offers native interoperability across parachains, it allows OriginTrail-introduced real-world assets to easily tap into the rest of the toolkits available in Polkadot - including Acala's DeFi Polkadot Hub.



OriginTrail & Acala | Integration of Decentralized Knowledge Graph for Acala Developer Ecosystem - [YouTube video](#)

This way, you will be able to have your real-world assets like art, cars, stock portfolio, savings or a house become an asset that you can use as collateral in DeFi to provide you with more liquidity when needed.



Notably, **Web3-ready assets can be created even before they take final shape** in the real world. As we equip them with innovative concepts like Uniform Asset Locators (UALs) which will allow for discoverability and verifiability across blockchain ecosystems, new opportunities arise. Making pre-built assets Web3-native will allow manufacturers and brands to create new financing and business models for their operations and bring their communities much closer to the process. Moreover, it enables owners to start their ownership experience even before they get their hands on a physical product, or even influence the production process with their voting. The possibility of such a significant increase in levels of liquidity in the production and brand-building process will sprout a plethora of new financial models that will be able to fuel innovation in many sectors globally.

The two-network layer approach comprising both the OriginTrail DKG and OriginTrail Parachain is poised to drastically change the way we are able to include real-world assets into the next generation Internet - Web3.

In the next chapters, we discuss the way value is being generated through both network layers synergistically and the way each user group involved in the OriginTrail ecosystem contributes and benefits from the value generated based on the principle of network effects.

2. OriginTrail technology stack

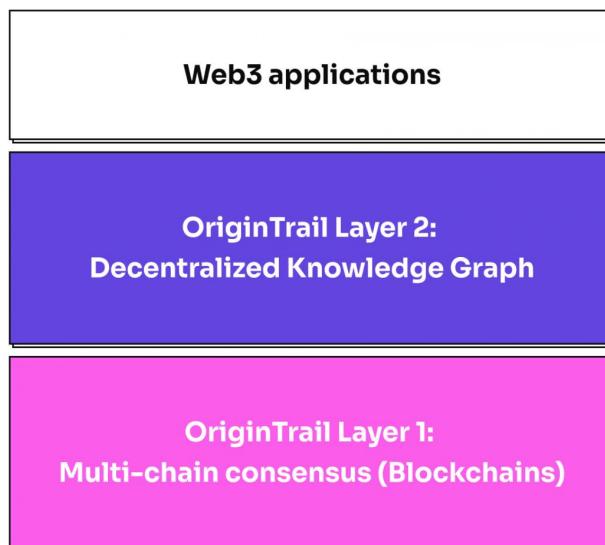
The OriginTrail technology stack is purposefully designed to bring real-world assets into Web3, enabling discoverability, verifiability, and connectivity of physical and digital assets in one coherent Web3 data ecosystem.

Two key requirements necessary for such Web3 infrastructure are the ability to ensure **trust via decentralized consensus** and utilize **semantic, verifiable asset data** for representing complex real-world relationships and characteristics (such as ownership, location, business context, etc). These distinct requirements require two distinct types of technology mentioned above – blockchains and knowledge graphs.

Blockchains are **trust networks**, designed to enable trusted computation through **decentralized consensus**, behaving like a global, trusted computer processor.

Knowledge graphs on the other hand are **semantic data networks**. Powering systems of Google, NASA, Amazon, and others, knowledge graphs are connected graph data structures best for representing complex assets and their relationships in the real world.

The OriginTrail technology stack leverages blockchains and knowledge graphs by incorporating them into **two network layers**.

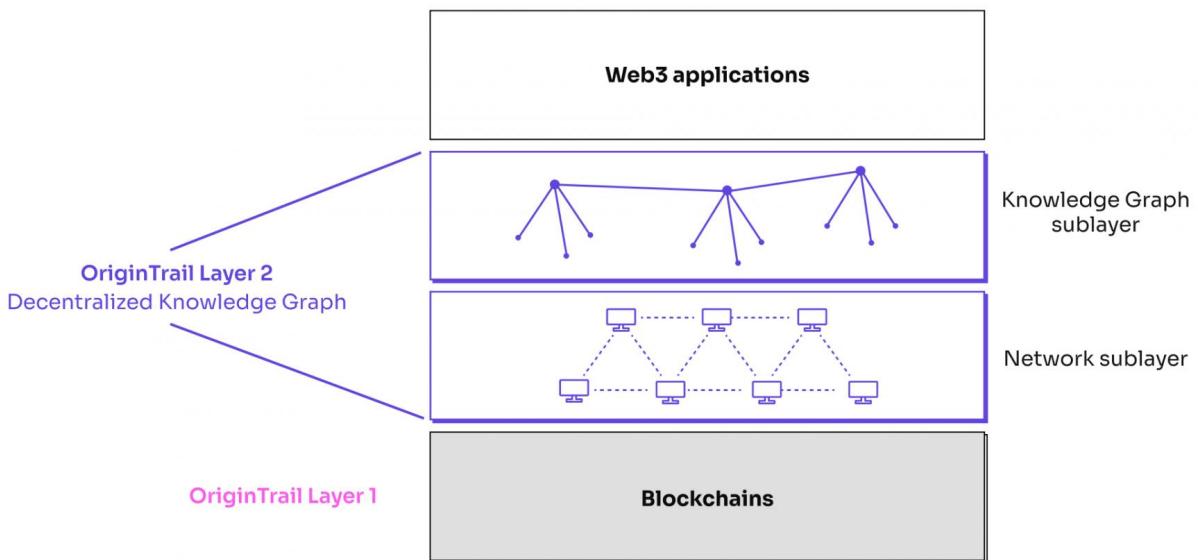


2.1 Layer 2: OriginTrail Decentralized Knowledge Graph (DKG)

The upper layer of the OriginTrail stack presents the ***OriginTrail Decentralized Knowledge Graph (DKG)***, a global trusted index for Web3 grade assets. It is hosted on the permissionless OriginTrail Decentralized Network, run by 2200+ OriginTrail DKG nodes globally (at the time of writing), and presents the first decentralized knowledge graph of its kind. Features such as decentralized search, asset tracking, recommendations, knowledge graph reasoning, and others are getting introduced in the latest iteration of the network (v6) launching in 2022.

The OriginTrail DKG is not a blockchain – it is a permissionless knowledge graph hosted on the OriginTrail Decentralized Network, run by DKG node runners across the globe. Anyone can contribute to the OriginTrail DKG and use its services via the **TRAC** utility token.

Layer 2: OriginTrail DKG



The unique feature of the OriginTrail DKG are DKG **Asset graphs**, supported by the novel DKG native Web3 primitives – **Uniform Asset Identifiers** and **Locators** (UAIs and UALs). Uniform Asset Identifiers/Locators are an extension to the URI/URL scheme of the Web, incorporating the design ideas and recommendations from W3C Decentralized Identifiers (DIDs) to form a

verifiable, interoperable Web3 URL system for Web3 grade assets indexed in the OriginTrail DKG. All assets indexed in the DKG, therefore, have a verifiable identity, semantic structure, and ownership, enabling the discoverability, verifiability, and queryability of assets indexed in the DKG.

The OriginTrail DKG is a unique decentralized system that facilitates **connectivity** as a core property of graph technology, driving network effects for all assets indexed in the DKG. Anyone can provision DKG asset graphs and associated UAI/UALs, connect them with other entities and assets in the DKG, and evolve their graph state in perpetuity. This includes the ability to sovereignly retain data ownership (via private graphs and ownable public state), which has been especially welcomed by the industry applications utilizing OriginTrail.

As with traditional knowledge graphs, the DKG can be queried (via query languages such as SPARQL or GraphQL), traversed, and extended with a plethora of techniques and applications coming from the semantic web and knowledge graph space. This is due to the fact that OriginTrail is built based on widely adopted industry standards (W3C, GS1). However, the DKG is uniquely positioned to leverage the benefits of rapidly evolving Web3 technology tools in its stack due to its natively decentralized Web3 infrastructure.

DKG network roles

There are 4 key network roles interacting with the OriginTrail DKG and its native TRAC token:

- Asset publishers,
- Asset consumers,
- DKG node runners,
- TRAC token holders.

Asset publishers create and update asset graphs in the DKG, indexing them with specific keywords for discoverability or publishing them on data marketplaces to monetize them. Asset publishers use TRAC to compensate the DKG node runners for ensuring the data persistence of their published asset graphs.

As assets get indexed to different keywords on the network, search queries for particular keywords result in multiple assets being presented in the search results in a particular order of relevance. If an asset owner wishes to have his/her asset show higher in the search results, they are able to lock up TRAC for a particular *Asset-Keyword* pair and signal their need for discoverability. The higher the stake of TRAC on a single keyword-asset pair in a particular set of assets returned in search results, the higher the asset will be positioned in the result list (similar to how Google AdSense puts your URLs higher in Google Search results).

Asset publishers can be individuals, organizations, or more generally systems publishing their asset data to the OriginTrail DKG (Web3 applications, enterprise systems, individual asset owners, etc).

Asset consumers, on the other hand, query the DKG to obtain the latest asset data. Depending on the parameters set by the asset owner, they might be required to bid/purchase access to asset data on data marketplaces, for which they can use TRAC. On other occasions, asset consumers can also bid/purchase the entire asset, transferring ownership of the asset to themselves.

The infrastructure of the OriginTrail DKG is run by **DKG node runners** – individuals and organizations running OriginTrail DKG nodes that host the permissionless network, receiving compensation in TRAC tokens for their services. DKG nodes can increase their chances of receiving compensation by locking up TRAC as collateral in their nodes, while a certain amount of TRAC as collateral is always required for network security purposes.

The system also enables **TRAC token holders** to be involved in the OriginTrail DKG network by delegating their TRAC to DKG node runners in exchange for a portion of rewards.

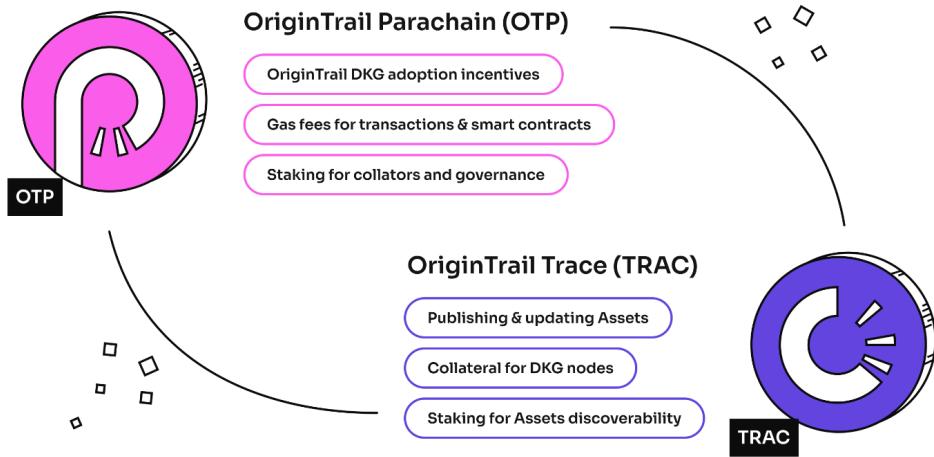
2.2 Layer 1: OriginTrail Multi-chain consensus layer

The ***OriginTrail consensus layer*** is composed of blockchains that enable trusted computation necessary for the DKG to operate in a decentralized environment. Currently deployed on Ethereum, Gnosis chain, and Polygon, OriginTrail is a multi-chain system with the ability to integrate all assets native to the connected blockchains and extend them with asset graphs and smart-contract-based applications such as data marketplaces.

In the existing version of the DKG (based on Ethereum-based blockchains), the OriginTrail ecosystem was effectively “outsourcing” the Layer 1 capabilities. With the addition of OriginTrail Parachain, the blockchain layer is now, for the first time ever, becoming an integral part of the OriginTrail ecosystem technology stack.

OriginTrail Parachain also introduces a native OriginTrail Parachain token (OTP) - a utility asset that is not only used for blockchain gas fees and inclusive governance but also **enables a way to incentivize the growth of DKG usage**. Together with TRAC, the two tokens form the OriginTrail ecosystem tokenomics, driving network effects and value for all network participants. OriginTrail, therefore, becomes an ecosystem with two technical components - two network layers and two utility tokens.

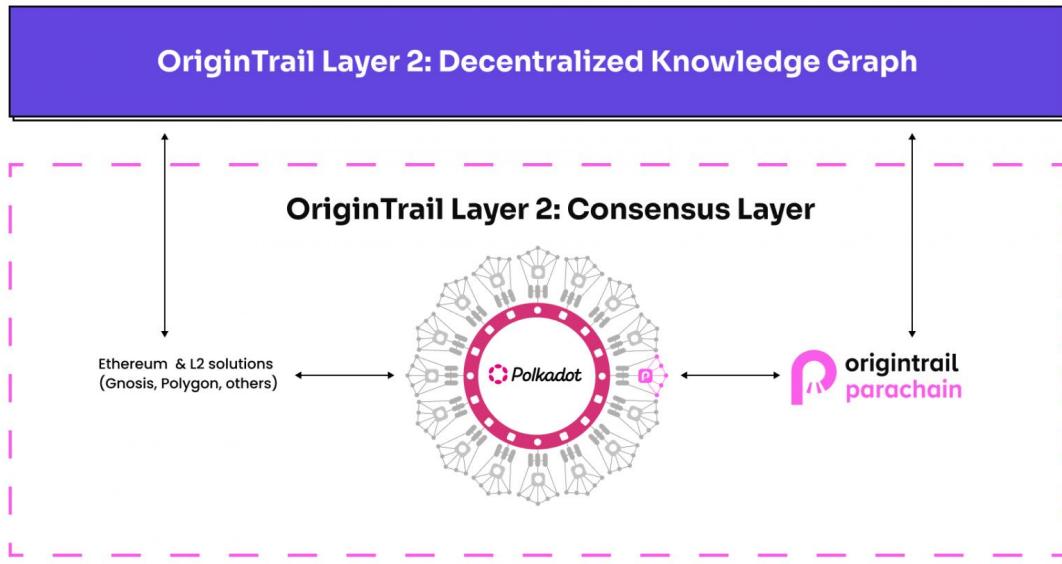
OriginTrail Ecosystem: Two networks layers, two tokens



The two OriginTrail technological layers - DKG and consensus layer - enormously benefit each other if tightly integrated. With the OriginTrail Parachain as a DKG-tailored blockchain, the OriginTrail stack receives additional capabilities and vastly improves in scalability and performance. Introducing the biggest extension to the OriginTrail stack yet - the OriginTrail Parachain on Polkadot.

3. OriginTrail Parachain - a DKG-tailored L1 blockchain

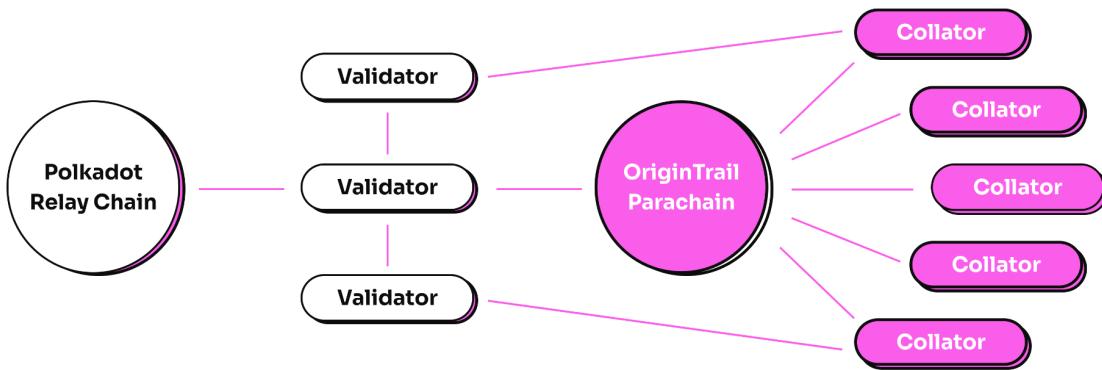
The **OriginTrail Parachain** is the **next-generation L1 blockchain** designed to tightly integrate with the OriginTrail DKG. As an OriginTrail-tailored blockchain, it is optimized for maximum performance and usability in the OriginTrail consensus layer. It leverages the strong trust model and inherent interoperability of Polkadot, enabling smooth integration with other Polkadot ecosystem projects.



OriginTrail Parachain has unique features designed to directly support the OriginTrail DKG:

- DKG usage growth incentivisation via the OTP token
- Tight integration with knowledge graph technology
- Vastly increased scalability and lower cost of L1 transactions
- EVM support to easily integrate with existing smart contracts and projects
- Governance features for the OriginTrail Parachain
- New blockchain functionalities leveraging the DKG such as Graph Contracts

With the OriginTrail parachain, an additional stakeholder of the OriginTrail ecosystem is introduced – the ***OriginTrail Parachain collators***, responsible for block production on the OriginTrail Parachain and their submission to the Polkadot relay chain validators. They are rewarded for their contributions to the network with the OTP token as the native L1 blockchain token.



More importantly, the **OTP token utility was designed to fuel the growth of the OriginTrail ecosystem by incentivizing the aforementioned network participants' contributions to the OriginTrail DKG.**

4. TRAC and OTP: supporting tokens designed for fueling network effects

As described in previous chapters, the ***OriginTrail DKG*** and the ***OriginTrail Parachain*** are **distinct technical components** in the Web3 infrastructure, each running on separate networks and **each having their own token system**. But since they are also a part of the same OriginTrail ecosystem, their token models are interacting to create a smoothly functioning experience for OriginTrail users as well as **drive network effects through incentivization**.

Both TRAC and OTP tokens exist as **utility tokens** for their respective components – TRAC for the DKG and OTP for the Parachain.

4.1 TRAC tokenomics

The ***Trace token (TRAC)*** is used for DKG operation and incentivizing protocol behavior. It is needed to perform the operations such as **publishing** on the network and is a **utility token that drives the entire DKG**. TRAC was launched in 2018 as an **ERC-20 token** on the Ethereum network with a fixed supply of **500,000,000 tokens**.

The core utility of TRAC is:

- **Publishing and updating assets** – Asset publishers are using TRAC to compensate OriginTrail DKG node runners who ensure data replication required for the discoverability of assets and verifiability of published data. The exact value of TRAC required for each data upload is dependent on market forces, but parameters like data longevity and size affect it.
- **Collateral on DKG nodes** – Locking TRAC by network participants running DKG network nodes acts as collateral that increases their stake in the network, increasing the node's chances of receiving fees for hosting a particular segment of the DKG.

- **Delegating to DKG nodes** - Token holders can delegate their TRAC tokens to those nodes that allow their stake to be increased by third parties. In return, they are able to earn part of the rewards that the node is receiving.
- **Staking on keywords** - Assets owners can lock up their TRAC to have their assets show up higher in search results of a particular keyword (similar to how Google AdSense impacts the discoverability of webpages in Google search).
- **TRAC as a fungible token** - Since TRAC is a fungible token created under the ERC-20 standard it is transferable and usable in any way ERC-20 assets are. This includes TRAC being included in smart contracts mechanisms created on any of the networks TRAC is operating in and is bridged to (at the time of writing Ethereum, Gnosis, and Polygon). One such example is data marketplace smart contracts which allow TRAC to be used as a compensation token for selling and purchasing Assets.

4.2 OTP tokenomics

The ***OriginTrail Parachain Token (OTP)*** is designed to directly support the growth of the OriginTrail ecosystem. As a tailored L1 blockchain token, the OTP's basic utility is to facilitate the transactions in the OriginTrail consensus layer (similar to ETH used on Ethereum). In addition to the basic utility, OTP is **used to incentivize the growth of the adoption of OriginTrail DKG**, to incentivize parachain collators and their delegators, and to enable inclusive development by on-chain voting.

The token is created with the launch of the OriginTrail Parachain on the Polkadot network and will be used for:

- **Fees for transactions and smart contracts** - All network participants utilizing the OriginTrail Parachain will be spending OTP to pay for transaction fees and smart contracts. Participants in the network can also lock up OTP and enable lower fees on the network by utilizing the "subscription model".
- **Incentives for collators** - The OTP network is issuing rewards for collators to perform the network function of collating the transactions in blocks and providing them to the Polkadot Relay chain validators.

- **Collateral for collators** - Collator candidates will need to lock their OTP as a way of signaling the amount of stake they are willing to keep locked for a particular period of time in order to receive collator rewards. The higher the locked amount, the greater the chance a collator candidate gets placed in the group of rewarded collators.
- **Delegating to collators** - Token holders can delegate their OTP tokens to those collators that allow their collateral (stake) to be increased by third parties. In return, they are able to earn part of the rewards that the collator is receiving.
- **Voting with OTP** - Token holders will be able to use their OTP to vote on update proposals for OriginTrail Parachain network and Community treasury proposals. In order to take part in the voting process, their OTP will have to be locked up for a particular amount of time.
- **OTP as a fungible token** - Since OTP is a fungible token created in the Polkadot ecosystem, it can be used like other assets in the Polkadot network - it can be transacted across different Parachains and used in smart contracts.

In addition to the token utility tied to the functioning of the OriginTrail Parachain as a blockchain layer network, the OriginTrail Parachain includes **DKG incentives** as part of the tokenomics model. The purpose of providing DKG incentives is to ensure that the OriginTrail Parachain is the most attractive blockchain layer for OriginTrail users and **boosts OriginTrail's network effects by providing further incentives for its adoption**.

4.3 Ecosystem tokenomics boosting network effects

The OriginTrail Parachain and DKG both function as separate systems on the tokenomics level as well. However, there is an important segment of the OTP parachain tokenomics, **DKG incentives, that ties the two systems together to boost network effects for each respective network**.

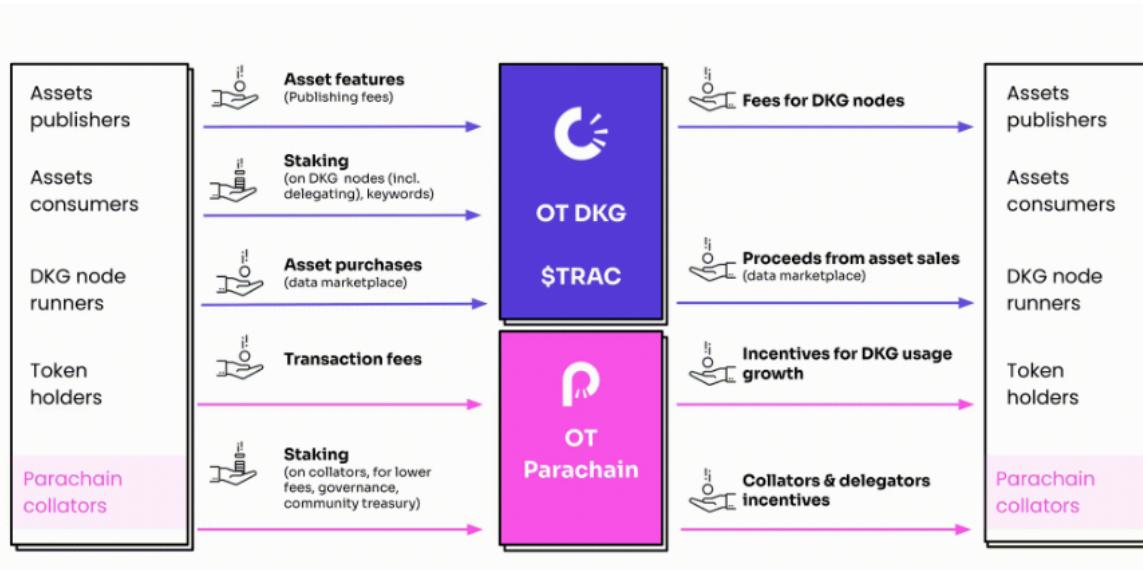
As a purposefully designed blockchain layer network for the use of the DKG, the OriginTrail Parachain is created to be the most attractive option in the blockchain layer for the users of the DKG, building expectation that the majority of current and future adoption of DKG to run through it. It achieves that due to:

- Its built-in incentivization engine contributing to the layer 2 (DKG) growth,
- Better performance in comparison to other blockchains, and
- DKG-specific features that will be developed over time (e.g. Graph Contracts).

Moreover, DKG users are deemed a crucial stakeholder in the OriginTrail Parachain and therefore the tokenomics of TRAC and OTP, while separate, share an incentive structure on the OriginTrail Parachain. One of three main incentivization pools (next to collator incentives and future auction pool) is created specifically for OriginTrail DKG incentives.

Using this pool, OTP tokens are distributed among the users of DKG for their positive activities of growing and strengthening the OriginTrail DKG. The core incentivized activities are:

- **Providing node collateral** – Users that are locking up TRAC either as DKG node runners or delegators can receive OTP rewards,
- **Keyword collateral** – Users that are locking up TRAC for asset discoverability for a particular keyword can receive OTP rewards,
- **Publishing/updating assets** – Users adding new data to the DKG by publishing assets or updating existing assets can receive OTP rewards,
- **Asset marketplace** – Users providing eligible bids for assets listed on the OriginTrail asset marketplaces can receive OTP rewards.



Having the OTP economy designed to grow the DKG and drive further utilization of TRAC tokens, **the dual-token system drives network effects in OriginTrail even further.**

On an **organizational level**, it incentivizes OriginTrail ecosystem participants (enterprises and individuals already leveraging OriginTrail) to expand their deployments further and drive integrations with new partners, increasing the magnitude of network effects together with increased scalability and new capabilities (an effect already observed with the OriginTrail DKG multi-chain implementation with the growth of network activity).

Furthermore, OTP incentivizes network effects on **the data level**, leveraging synergies uniquely enabled by knowledge graph technologies' inherent connectivity. Driven by the connectivity of a growing number of indexed assets in the DKG, network effects are facilitated by UALs, similar to search engines in Web2 (such as Google leveraging network effects by indexing websites via their URLs).

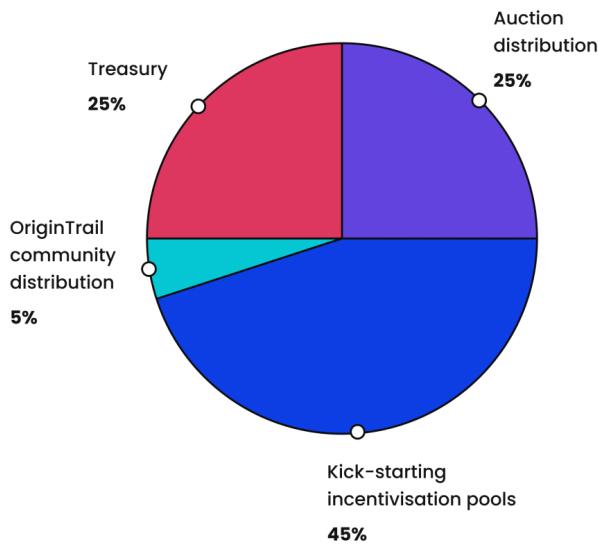
Finally, OTP enables **cross-blockchain network effects** due to OriginTrail Parachain inherent interoperability with other blockchains throughout Polkadot's interoperable blockchain ecosystem. This way, the potential of the OriginTrail DKG expands to new use cases and utility for all Polkadot-based projects with DKG features becoming immediately available and accessible to all respective ecosystems.

5. OTP Genesis distribution

The total supply of OTP that will ever be created is limited to 1,000,000,000 tokens. However, out of the maximum amount of tokens, only half will be initially allocated, whilst the remaining half will be minted through inflation in perpetuity, asymptotically reaching a 1,000,000,000 OTP maximum supply.

If we start by looking at the distribution of the initially allocated half of the OTP supply, it gets divided among:

- Kick-starting incentivization pools (45%),
- Initial auction distribution (25%),
- The treasury (25%), and
- OriginTrail community distribution (5%).



The **OTP has had no presale of tokens and no pre-distribution**. It will solely be available via the distribution mentioned above and will have utility from day 1 of its existence.

5.1 Initial auction distribution

The OriginTrail Parachain is secured only by winning a Polkadot auction in which candidate ecosystems for Parachains are showcasing their support for a parachain by locking up DOT tokens (native Polkadot tokens) for a period of time in which they wish to use a parachain slot. The OriginTrail Parachain approach will therefore have to entail taking part in the same auction process in which it will have to show a higher level of support than the rest of the ecosystems aiming for a Parachain in the same period (more on Polkadot auctions [here](#)).

In order to attract and reward the participants of the Parachain auction process, there are up to 125,000,000 OTP tokens allocated, which will get distributed amongst the contributors, showcasing a relevant stake in the future of OriginTrail Parachain allocated for such participants. Any unspent OTP from the initial auction process will be added to the Future auctions pool.

5.2 Kick-starting incentivization pools

There are in total 3 incentivization pools that are being created, together with an additional community treasury pool, with a total amount of 225,000,000 OTP. They are:

- **Collator incentives pool** - A pool of OTP tokens used to reward the selected collators and their delegators performing their network functionalities (producing blocks submitted to the Polkadot Relay chain validators).
- **Future auctions pool** - As auctions for the OriginTrail Parachain will have to be won in perpetuity, this pool ensures that there is always a significant enough amount of OTP at disposal to reward future participants in such auctions.
- **DKG incentives pool** - A driver of the Parachain adoption by the OriginTrail community of users and an important kick-start of the network effects on both DKG and OriginTrail Parachain. It is intended to support positive activity on the DKG network such as asset publishing/updating, staking, and delegating TRAC to nodes, staking TRAC to keywords for visibility, using TRAC data marketplaces, and other similar activities in the future.

- **Community treasury pool** - A pool of OTP tokens intended to support a diverse range of community actions that receive enough support through the OTP voting mechanism.

Each of the first three pools will have a designated amount of 70,000,000 OTP, while the Community treasury has an allocation of 15,000,000 OTP. It is important to note that not all OTP is immediately distributed to the pools at the genesis block but is rather made available over the course of a longer period of time, up to 10 years.

5.3 OriginTrail community distribution

Since the OriginTrail DKG community represents such an important part of the OriginTrail Parachain success, there is also a 25,000,000 OTP allocation that will get distributed among two key groups of the OriginTrail DKG community:

- **TRAC token holders** - The first of the two groups has an allocation of 20,000,000 OTP allowing 1 OTP to be claimed for every 25 TRAC in all TRAC wallets snapshotted at the moment of successful completion of the OriginTrail Parachain auction.
- **OriginTrail DKG node runners** - This community group has an allocation of 5,000,000 OTP which will be possible to claim on the basis of how much time a particular DKG node was active in the network in the period of 1 year from the beginning of the multi-chain OriginTrail Starfleet phase (March 23, 2021 – March 23, 2022).

5.4 Treasury

Treasury is a pool of OTP tokens that is managed by the core development team in order to:

- Take part in the voting process for on-chain upgrades of the OriginTrail Parachain,
- Fund future development needs of the OriginTrail Parachain,
- Incentivize key team members and advisors.

It is vested longer than the rest of the initial distribution (25% at genesis distribution and the rest linearly over 4 years).

5.5 Vesting schedules

Each segment of the Genesis distribution is subject to a vesting schedule that will release the total amounts over longer periods of time. The schedules are as follows:

- Initial auction distribution rewards - 25% at genesis block, 75% evenly over the first lease period.
- OriginTrail community distribution - 25% at genesis block, 75% evenly over the first lease period.
- Treasury - 25% at genesis block, 75% evenly over 4 years.
- Future auctions pool - falling curve over 6 years.
- Collators incentives pool - falling curve over 10 years.
- DKG incentives pool - falling curve over 10 years.
- Community treasury pool - falling curve over 10 years.

5.6 OTP inflationary release

Even though OTP has a defined maximum supply at 1B OTP, it also features a perpetually growing circulating supply. This is achieved by allocating half of the token supply to a mechanism that will annually release 5% of the amount of tokens remaining to be minted. A short example of the first few years would yield annual additional circulation of:

- *Year 1 total inflation: $500,000,000 \text{ OTP} * 0.05 = 25,000,000 \text{ OTP}$*
- *Year 2 total inflation: $475,000,000 \text{ OTP} * 0.05 = 23,750,000 \text{ OTP}$*
- *Year 3 total inflation: $451,250,000 \text{ OTP} * 0.05 = 22,562,500 \text{ OTP}$*
- *Year 4 total inflation: $428,687,500 \text{ OTP} * 0.05 = 21,434,375 \text{ OTP}$*
- ...

The inflation amount is used to fund the already mentioned key incentivization pools - Collators incentives pool, Future auctions pool, DKG incentives pool, and Community treasury pool. The distribution among the 4 pools on an annual basis is 10% for community treasury and 30% each between the remaining three pools.

The total allocation among different pools taking into account both the genesis release and the inflationary release is as follows:

- Collators incentives - 22%
- Auction rewards - 22%
- DKG incentives - 22%
- Initial auction rewards - 12.5%
- Treasury - 12.5%
- Community treasury - 6.5%
- OriginTrail community drop - 2.5%

