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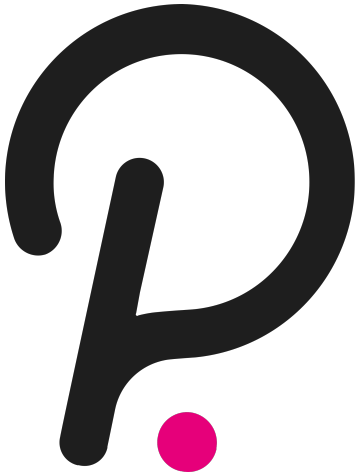
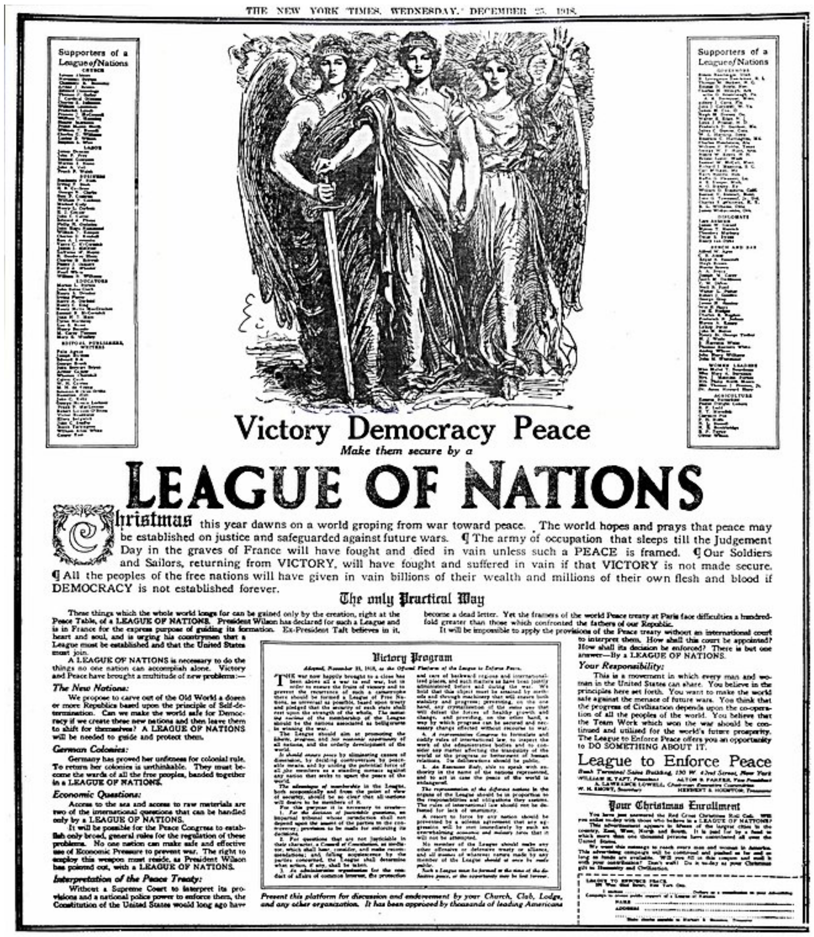
The League Of Parachains: Polkadot

A Layer Zero For Collective Security



September 17, 2021

Advocacy for the formation of a League of Nations in the New York Times, 1918.



THE NEW YORK TIMES, WEDNESDAY, DECEMBER 25, 1918.

Supporters of a League of Nations

Victory Democracy Peace

Make them secure by a

LEAGUE OF NATIONS

Christmas this year dawns on a world groping from war toward peace. The world hopes and prays that peace may be established on justice and safeguarded against future wars. ¶ The army of occupation that sleeps till the Judgement Day in the graves of France will have fought and died in vain unless such a PEACE is framed. ¶ Our Soldiers and Sailors, returning from VICTORY, will have fought and suffered in vain if that VICTORY is not made secure. ¶ All the peoples of the free nations will have given in vain billions of their wealth and millions of their own flesh and blood if DEMOCRACY is not established forever.

The only Practical Way

These things which the whole world longs for can be gained only by the creation, right at the Peace Table, of a LEAGUE OF NATIONS. President Wilson has declared for such a League and is in France for the express purpose of guiding its formation. Ex-President Taft believes in it, heart and soul, and is urging his countrymen that a League must be established and that the United States must join.

A LEAGUE OF NATIONS is necessary to do the things no one nation can accomplish alone. Victory and Peace have brought a multitude of new problems:—

The New Nations:

We propose to carve out of the Old World a dozen or more Republics based upon the principle of Self-determination. Can we make the world safe for Democracy if we create these new nations and then leave them to shift for themselves? A LEAGUE OF NATIONS will be needed to guide and protect them.

German Colonies:

Germany has proved her unfitness for colonial rule. To return her colonies is unthinkable. They must become the wards of all the free peoples, banded together in a LEAGUE OF NATIONS.

Economic Questions:

Access to the sea and access to raw materials are two of the international questions that can be handled only by a LEAGUE OF NATIONS.

It will be possible for the Peace Congress to establish only broad, general rules for the regulation of these problems. No one nation can make safe and effective use of Economic Pressure to prevent war. The right to employ this weapon must reside, as President Wilson has pointed out, with a LEAGUE OF NATIONS.

Interpretation of the Peace Treaty:

Without a Supreme Court to interpret its provisions and a national police power to enforce them, the Constitution of the United States would long ago have become a dead letter. Yet the framers of the world Peace treaty at Paris face difficulties a hundred-fold greater than those which confronted the fathers of our Republic.

It will be impossible to apply the provisions of the Peace treaty without an international court to interpret them. How shall this court be appointed? How shall its decision be enforced? There is but one answer—By a LEAGUE OF NATIONS.

Your Responsibility:

This is a movement in which every man and woman in the United States can share. You believe in the principles here set forth. You want to make the world safe against the menace of future wars. You think that the progress of Civilization depends upon the co-operation of all the peoples of the world. You believe that the Team Work which won the war should be continued and utilized for the world's future prosperity. The League to Enforce Peace offers you an opportunity to DO SOMETHING ABOUT IT.

Victory Program

Present this platform for discussion and endorsement by your Church, Club, Lodge, and any other organization. It has been approved by thousands of leading Americans

League to Enforce Peace

Your Christmas Enrollment

Formed in the aftermath of World War I, The League of Nations became the first international attempt at "collective security".

The above image is taken from a full-page promotion by The League to Enforce Peace, published in 1918, and reads:

"[The League] should ensure peace by eliminating causes of dissension, by deciding controversies by peaceable means, and by uniting the potential force of all members as a standing menace against any nation that seeks to upset the peace of the world."

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Executive Summary

Polkadot has a novel answer to the multi-chain problem analogous to coexistence between nation states within the international community. Each nation pursues its own destiny and vision for the future, yet these disparate cultures come together to form alliances, engage in trade and live in a world of diplomacy rather than warfare.

This is the idea behind the Relay Chain, Polkadot's "Layer Zero" (L0). Developers build custom blockchains that meet the needs of particular applications and users ("the Parachains"), but these chains cooperate under one banner of shared security. They each focus on building the core competencies of *their Layer One (L1)*, but collectively share the security of *the L0*.

Polkadot's goal is to thus become the blockchain of blockchains, separating state from application and allowing each L1 focus on its own chain's customizability. The L1s outsource security to the mothership: each nation receives the benefits of a standing army without needing to raise, maintain and deploy a standing army. The Parachains can thus redeploy resources otherwise spent on L1 security into their chain's core competency. This shared security unlocks (1) Parachain customizability without sacrificing security and (2) built-in interoperability between different Parachains.

Polkadot requires unique economics. The Parachains depend on Relay Chain security, but security is not free. It is scarce. Parachains slots are therefore scarce, with an entire economic architecture built around how developers acquire, maintain and outsource aspects of security to the L0 – again analogized to the way a nation would join and maintain status within a global order.

To price and allocate the scarce resource of network security, Polkadot turns to the free market: to the candle auction. These enable permissionless, competitive and fair allocation of resources, financed by the network's future users through a process known as CrowdLoans. Projects that can't secure a Parachain slot can still access Relay Chain security by renting it out from winning Parachain slot holders through a pay-per-use model.

In this report, we unpack the technical and philosophical foundations of Polkadot. The first section will focus on how Polkadot answers the blockchain trilemma, converging on the customizability of the Parachains. The second section will unpack the financing of Parachains through CrowdLoans, candle auctions and Parathreads. In the third and final section, we explore prominent Parachain pioneers and describe how they are leveraging Polkadot's architecture to build their own custom blockchains.

Contents

1 Polkadot: The Layer Zero

1.1 The Multi-Chain World Hypothesis

We will live in a multi-chain world. Nation states are differentiated by their shared histories, diverse countrymen and comparative advantages in trade and production. So too, blockchains will offer capabilities to users with a wide range of needs. Every tribe will have a blockchain best suited for its objectives. Different political and economic philosophies will manifest as consensus algorithms and emission schedules.

The multi-chain world will arise in the image of its users. Live monetary experiments unlock a new monetary order: users can seamlessly migrate to chains that reflect their worldview – whether they are Austrians, Keynesians or anything in between.

The same users will *simultaneously* live on different chains, a testament to the fragmentation and inconsistency of the human personality. The multi-chain world is a natural evolution of a multi-nation world: while more unconstrained by geography than ever before, it will still need a center. It will require infrastructure for diplomacy, trade and peacekeeping.

This is at the core of Polkadot and its contribution to the multi-chain landscape.

1.2 The Blockchain Of Blockchains

1.2.1 Solving The Trilemma: The Separation Of Application And State

DeFi in 2020 and NFTs in 2021 validated the multi-chain hypothesis. Yet these summer booms also demonstrated the extent to which developers and users are beholden to narrow design parameters. They must choose a chain and accept its version of finality, security and consensus, sufficient for some applications but not others. Users thus have no choice but to either compete for resources (e.g. gas wars) or fit suboptimal designs to this constrained environment (e.g. DEX design: AMMs vs. CLOBs).

The most common conclusion from Ethereum's constrained experiments is that Ethereum needs to scale. While this could alleviate congestion and reduce transaction costs, users are *still* stuck in a single-blockchain paradigm – they are beholden to the laws of a single government.

An alternative conclusion is that no (or very few) networks will ever be suited for all applications. Instead, we start application-up. Which blockchain should host said use case? High value transfers need extraordinary security at the expense of throughput and settlement time. Small but frequent transfers don't require this, but need to be fast (e.g. payment channels, derivatives trading, gaming points).

Naturally, specializing in this way will come at a cost. A more general representation of these tradeoffs is the *blockchain trilemma: the idea that there is always a tradeoff between scalability, security and decentralization.*

Our view is that there will be different approaches to the trilemma over time. We previously wrote about Vega's app-chain approach[1], tackling the trilemma by building an L1 for its application (derivatives), as well as Algorand's desire[2] to build a single base layer which solves the trilemma through innovations in cryptography.

[1] URL: https://arringtonxrpcapital.com/2021/06/01/the-space-race-for-open-markets-vega/.
[2] URL: https://arringtonxrpcapital.com/2021/07/19/illuminating-the-dark-age-of-blockchain-algorand/.

Polkadot approaches this problem by abstraction[3]*, allowing different chains to coordinate and collectively solve the trilemma.* It behaves like a network of networks, decoupling state from application. Every Parachain is its own L1. Developers can customize their security guarantees without giving up performance. Polkadot doesn't try to solve the trilemma at L1 (Parachains), but instead acts as the L0 (the Relay Chain), coordinating between all of these custom blockchains. *Polkadot's answer to the trilemma is thus focused on composability: each blockchain configures its own parameters along a spectrum of decentralization and scalability.*

More importantly, *because of abstraction, Polkadot's L1 blockchains are completely customizable.* Parachains dictate their own architecture, consensus mechanisms, and so on, but rely on L0 for security. Hence, like nation states, Parachains focus on their competitive advantages while co-existing inside of a wider league of blockchains. Each chain enjoys the security of the collective – just as a single nation enjoys protection from an international military council. Joining Polkadot is akin to joining an organization like NATO: the L0 is underpinned by the notion of collective security, protecting a global ecosystem of Parachains.

A second and arguably more overlooked byproduct of security abstraction is interoperability. Since different Parachains coordinate security through the Relay Chain, the Relay Chain can route information between Parachains. This means critical infrastructure like decentralized oracles and bridges can live natively inside the network, benefitting from the same security guarantees.

L1s can trade unilaterally without forming bilateral agreements. Being a part of the Relay Chain is also like being a member of the WTO. The Parachains can communicate and transfer value while relying on a single infrastructure – the collective security of the network. Polkadot thus removes the need for each oracle or bridge to separately bootstrap its own security, creating economies of scale and again allowing the Parachains to double down on their own comparative advantage.

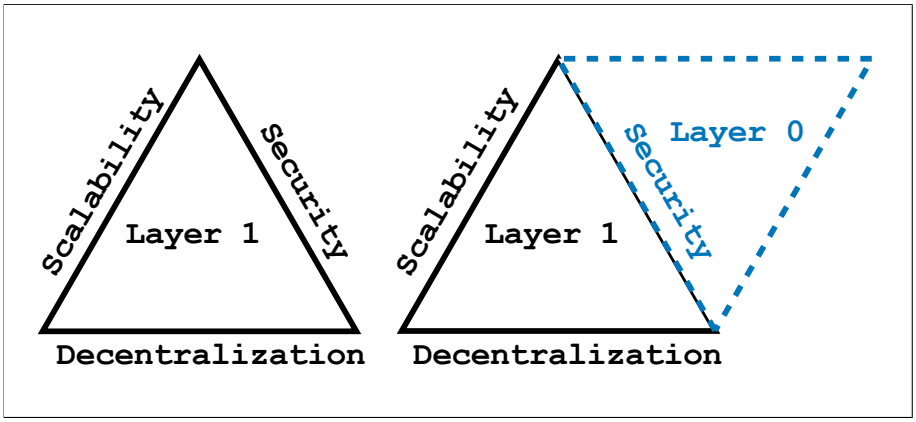

Figure 1: Left: The blockchain trilemma for L1 blockchains – some tradeoff between scalability, security, and decentralization will always exist. Right: Polkadot's approach to solving the trilemma: abstracting security guarantees from L1, thus acting as a L0 that coordinates L1 blockchains to achieve security and scalability. This is how Polkadot enables a customizable multi-chain world.

1.2.2 The Origin Of Parachains

If a developer wants to deploy a dApp, they can either deploy on an existing blockchain or build their own custom blockchain. The advantage of deploying on a major blockchain like Ethereum is that dApps

[3] URL: https://wiki.polkadot.network/.

inherit the security and liquidity guarantees of the parent network. The drawback is that developers (and ultimately users) are constrained by the consensus properties of L1. Since the blockchain is not customized for the dApp, users are by-definition second class citizens on the network.

The alternative is to deploy on a separate, custom blockchain, optimized for the dApp. The problem with this app-chain approach is that custom blockchains need to bootstrap their own security. New blockchains need to attract enough capital to protect consensus, ultimately running into a cold-start problem.

On their own, each potential L1 may not have enough economic value to bootstrap the network, but what if they could band together? Then – a long tail of blockchains could attract enough value to become secure. What if there was a way to allow small dApps to pool capital and bootstrap security as one collective, even if too small to do this on their own?

Polkadot offers this third alternative: the Parachains. Parachains are L1 blockchains that coordinate with the Relay Chain, outsourcing security guarantees. Parachains have their own set of nodes ("Collators") that coordinate with Relay Chain nodes ("Validators"). Roughly, Collators produce blocks that Validators verify and sign to generate a Relay Chain Block. Validators verify blocks from any of the Parachains, rotating between different Parachains to prevent collusion.

The net effect: developers can launch dApps on custom-built blockchains but still coordinate security with other chains through the L0. That is the defining feature of Polkadot: Parachains enable dApps to share security without sacrificing customizability.

By separating state and application, the Relay Chain[4] does not store the state of the Parachains – it's only concerned with the change in state and not the state itself. Hence, the Relay Chain is not burdened by the storage requirements of the various Parachains, making every Parachain a first-class citizen.

1.2.3 Outsourcing Security: The Relay Chain

Polkadot's consensus algorithm separates state from application[5]. The Relay Chain uses a nominated Proof-of-Stake model for consensus, with Validators staking a bond to ensure honest behavior. Other Validators monitor Validator misbehavior. Relay Chain Consensus occurs (roughly) in the following manner:

1. Each Parachain, *using its own custom consensus mechanism*, proposes block candidates and submits them to the Relay Chain
2. Relay Chain Validators, assigned randomly to a given Parachain, verify and distribute the candidate blocks that they received from the Parachains
3. A selected validator proposes a new Relay Chain block using the verified Parachain block candidates
4. Other Validators monitor the block proposition (for both Parachain and Relay Chain blocks) and vote to finalize a Relay Chain block (finality is deterministic).

By allowing the Parachains to use their own consensus algorithm but coordinate through the Relay Chain, *Parachains can remain scalable and decentralized while outsourcing security to a L0.*

[4] URL: https://wiki.polkadot.network/.
[5] URL: https://wiki.polkadot.network/.

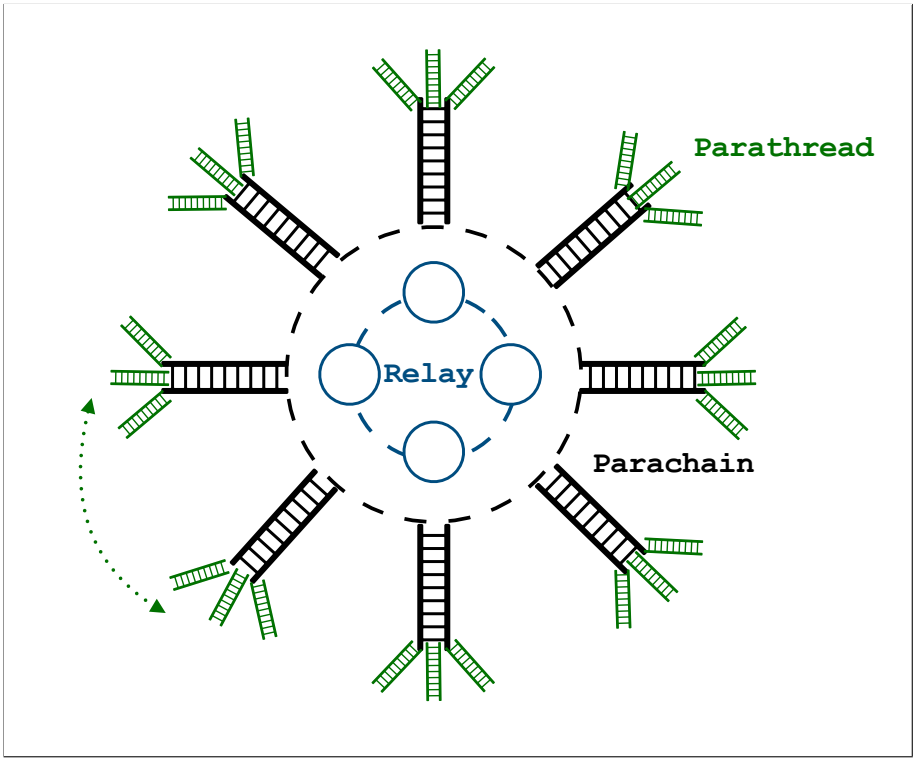

Figure 2: The Polkadot architecture consists of three major components:
(1) an L0 Relay Chain acting as the shared security hub,
(2) L1 Parachains that operate independently but lease security from the Relay Chain for fixed leases, and;
(3) Parathreads, which are L1s that periodically rent out Relay Chain security but do not have a fixed Parachain Lease.

2 The Polkadot Parachains

Owing to the Relay Chain's shared security, Polkadot can only accommodate a finite number of Parachains with sufficiently high security guarantees. Parachains are thus scarce and candidates must compete for a slot. They must convince the market that *they* should be anchored to the Relay Chain.

The total number of slots is a function of the number of Relay Chain Validators (which is constrained by computation limits). At a ratio of 10 validators per parachain, the current ∼1000 validators can accommodate ∼100 parachain slots.

Below we describe how L1s compete for Parachain slots and how Parachains can rent out their services to Parathreads (L1s that wish to use the Relay Chain without obtaining a Parachain slot).

2.1 Wisdom Of The Crowds: Parachain Auctions & Crowdloans

Parachain slots are the network's prime real estate. They are valued and distributed by a free market. As described below, slots are priced through Candle Auctions. Candidate Parachains finance their bids by raising capital through a process known as CrowdLoans.

2.1.1 Decentralized Financing: CrowdLoans & Parachain Leases

To deploy on a Polkadot Parachain, an L1 has to acquire a Parachain Lease (up to two years in duration). They bid for a Parachain with DOT (the L0's native token), raising this DOT through a Crowdloan. Winning bids are locked as stake in the network for the duration of the lease (two years) and used for governance on the Relay Chain.

The community – future users of the Parachains – finance these bids. Parachain resources thus reflect community demand. More importantly, since bids are staked for the duration of the lease, financiers and Parachain candidates have aligned incentives. Financiers can remove their capital once the lease expires, and so Parachain winners must re-bid to maintain their slot, again making their case and attempting to convince the community.

To attract this financing, Parachain candidates will typically issue tokens (granting governance rights in the Parachain project) in return for DOT.

2.1.2 Efficient Pricing: Candle Auctions

To promote fair and efficient pricing, Polkadot uses candle auctions when distributing Parachain slots. Historically, a candle auction was one where bids would continue until a candle was extinguished – making the auction period truly unknown. Participants are bidding in a period with an unknown duration and at some randomly selected time, the auction ends.

In Polkadot, the candle auction is implemented by using a *fixed duration auction but retroactively selecting the end time of an auction after the fact* (which occurs during a subset interval, e.g. on Kusama the auction expiration is assigned randomly during the last two days). This design ensures that bids express their true value, efficiently pricing and allocating Parachain slots.

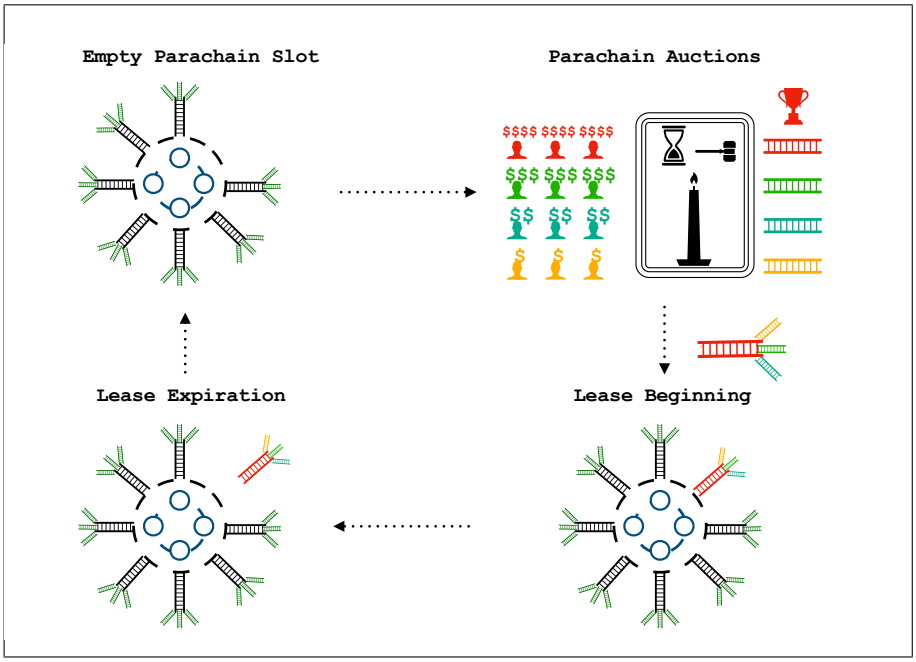

Figure 3: Parachain candidates finance their bids through CrowdLoans. During a candle auction, the optimal strategy is for each bidder to place their maximum bet. The winner of an auction receives a fixed duration Parachain lease. Losing bids can still periodically use the Relay Chain by becoming a Parathread on any of the Parachains. At the expiration of a less, the auction process repeats.

2.1.3 Something For Everyone: Parathreads & Common Good Chains

2.1.3.1 Parathreads

Since there are only ∼100 Parachain slots available, what happens to the long tail of applications? Again, Polkadot leaves this to market forces. Parathreads, L1s that could not secure a Parachain, can still use Parachain infrastructure to periodically connect to the Relay Chain.

Instead of leasing a slot by staking capital upfront, Parathreads incur pay-as-you-go fees – effectively renting the network's prime real estate.

If a Parathread project garners enough demand, it can bid for an empty Parachain slot once a slot becomes available. Similarly, a Parachain project that no longer satisfies market demand can be relegated to a Parathread. In this way, market forces continuously govern the allocation of resources in the Polkadot network.

2.1.3.2 Common Good Chains

Another example of a long-tail project are "Common Good" projects such as external bridges to the Polkadot network (say from the Bitcoin network). In this case, all Parachains benefit from the existence of such a bridge, but the economic benefit might not be high enough to warrant a winning bid in a Parachain auction. Instead, the Parachains (and DOT holders in general) can collectively vote to finance a common good thread to avoid a tragedy of the commons. Projects competing for Common Good Chains cannot issue their own token, since they are funded directly by governance (DOT holders).

3 The Parachain Pioneers

3.1 The Canary Network: Kusama

Polkadot has an incentivized TestNet known as Kusama[6]. This is Polkadot's "canary network", the testing ground for new projects and features. Virtually identical to Polkadot in architecture, Kusama has taken on a life of its own, hosting the first set of Parachain auctions.

Generally, projects bidding for Polkadot Parachains will launch a sister project on Kusama due to lower value-at-risk (which gives more freedom to deploy experimental features). Kusama will likely serve as Polkadot's companion chain that gives a home to long-tail Polkadot Parachain candidates and for Parachains with lower security requirements. Kusama can therefore bridge the gap between Polkadot's Parachains and Parathreads: projects will try to either secure a Parachain on Polkadot, become a Parathread on Polkadot or secure a Parachain on Kusama.

Below we summarize the inaugural winners of the Kusama Parachain auctions and their counterpart projects on Polkadot.

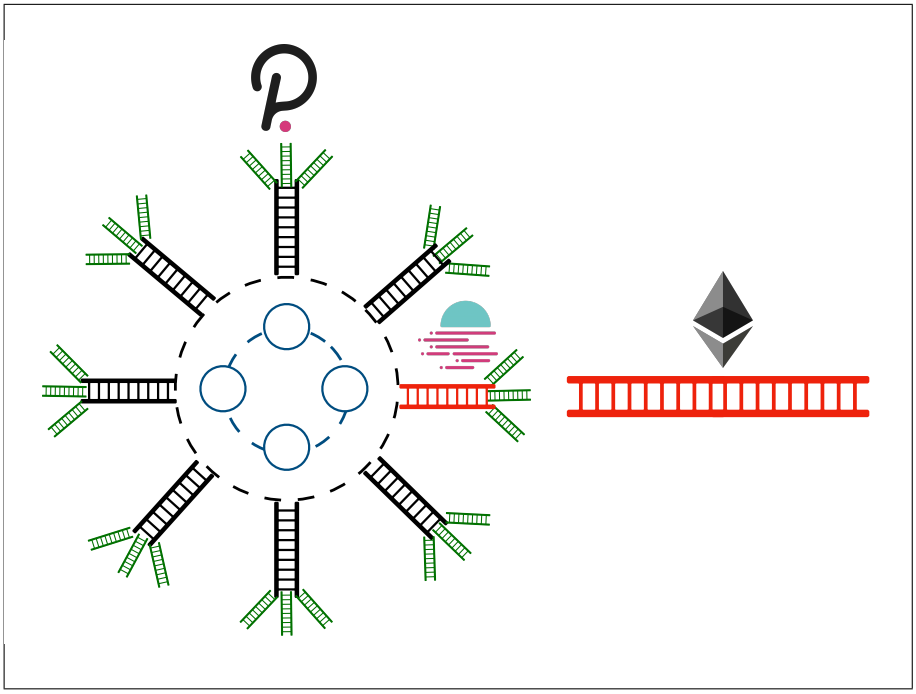

Figure 4: Moonbeam combines Ethereum's vibrant ecosystem with Polkadot's customizability and native interoperability to usher in the multi-chain world.

3.2 The Customizable Ethereum: Moonbeam & Moonriver

In some sense, Moonbeam[7] is the ultimate realization of multi-chain nationhood: it is the Parachain whose core focus is diplomacy and trade with Ethereum. Moonbeam (Moonriver on Kusama) is an EVM Parachain that aims to amplify the current experience on Ethereum by allowing dApps to easily deploy

[6] URL: https://kusama.network/.
[7] URL: https://moonbeam.network/.

on Polkadot. Moonbeam is fully compatible with Ethereum contracts and tooling (including development frameworks, oracles, indexing tools, contract bundles, and so on) and uses Proof-of-Stake consensus with a permissionless Collator set.

The project enables a development and execution environment identical to Ethereum's with added benefits of built-in interoperability with other Parachains and extended base layer functionality (on Moonbeam), including staking, governance and cross-chain transfers. Like every Parachain, it functions as its own L1, particularly attractive for developers searching for optionality between Polkadot and Ethereum. As an olive branch into the largest developer community, the Moonbeam Parachain and ecosystem may serve as an indicator for the success or failure of the multi-chain thesis more broadly.

3.3 The Native DeFi Chain: Acala & Karura

Acala[8] (Karura on Kusama) is an EVM-compatible DeFi layer on Polkadot. It is Polkadot's first native DeFi chain. On Acala, DeFi is fundamentally different from Ethereum and other L1s. On Ethereum, developers can only customize applications at the smart contract level (i.e. the application layer). Beyond the application layer, they have no control over how the Ethereum blockchain operates. They cannot control gas fees or the currency in which they are paid.

Acala brings Polkadot's spirit of customizability to DeFi: developers can step outside the smart contract sandbox and optimize core blockchain logic for DeFi. Gas fees can be paid with any token, what Acala refers to as Economic Abstraction. Acala also enables native DeFi primitives so that developers can solve domain-specific problems such as scheduled liquidations (for borrow/lend dApps), guaranteeing protocol solvency during liquidity crises.

Other customizable features include whitelisting transaction types (e.g. oracle price feeds update transactions can be gasless) to ensure they are always included in every block. This is important during liquidity crises and incentivizes faster liquidations and stronger solvency guarantees – again solving a domain-specific challenge within DeFi.

3.4 Polkadot's Layer Two: Astar & Shiden

Astar Network[9] (Shiden on Kusama) is a scalable, EVM-compatible smart contract platform that supports Layer Two (L2) scaling solutions and aims to build Ethereum 2.0 on top of Polkadot. Astar will support state-of-the-art rollups including Plasma, Optimistic and ZK-rollups. By enabling L2 technology natively on Polkadot, Astar scales throughput without dApp siloing and liquidity fragmentation. By occupying a Parachain, Astar unlocks L2 scalability for Polkadot Parachains while maintaining interoperability. In theory, given Polkadot's fundamental interoperability, this could help solve the existing fragmentation of L2 on Ethereum.

3.5 The Decentralized Cloud: Phala & Khala

The Phala Network[10] (Khala on Kusama) is a decentralized and private cloud computing network. Phala allows large-scale private computations on the blockchain by separating the consensus and computation processes. Phala uses Nominated Proof-of-Stake consensus where computation tasks are randomly assigned to different nodes in the network. By guaranteeing data privacy at scale, Phala enables intensive

[8] URL: https://acala.network/.
[9] URL: https://astar.network/.
[10] URL: https://phala.network/.

and sensitive data processing, such as identity verification, healthcare, proprietary trading, and on-chain forensic analysis.

3.6 The Staking Hub: Bifrost

The Bifrost Network[11] (also Bifrost on Kusama) is a protocol for unlocking the liquidity of staked capital. It is an intermediate abstraction layer built between the validator staking layer and the user application layer. Bifrost eliminates the opportunity cost of securing the network.

Users can deposit any Proof-of-Stake token into the Bifrost Network, which will then issue a 1:1 staking derivative and use a cross-chain bridge to stake the asset on its native chain. Staking yields then accrue to the derivative token.

3.7 The Polkadot Indexer: SubQuery

To coordinate between one another, Parachains need a secure and decentralized data aggregation layer that standardizes communication between applications. SubQuery[12] is a chain-agnostic decentralized data aggregation, indexing and querying layer between blockchains and applications. It abstracts away blockchain-specific data idiosyncrasies using the SubQuery SDK.

If Parachains are nations and the Relay Chain is an international alliance of these nations, then SubQuery is the common language – the lingua franca – for this new global order. SubQuery enables seamless communication between dApps in and across Parachains. Using SubQuery, developers can deploy applications onto a Parachain without building their own querying frameworks.

Application developers (Consumers) request data from the blockchain while Indexers work to clean and provide this data. Data indices are built according to a manifest – a document describing which data from which particular protocol needs to be indexed. Nodes, operated by Indexers, record these instructions (i.e. what event to listen to, how to store the data and in which form), updating the data indices with new data fetched periodically.

SubQuery uses a data marketplace to efficiently allocate capital and Parachain data. Unlike other data indexing protocols, the Consumers and Indexers equally share the cost of indexing upfront. Consumers and Indexers enter into a bespoke agreement, known as a Purchase Order Contract, agreeing on the structure of the data index, with the Consumers paying the cost upfront. Hence, the Indexers are guaranteed revenue if they deliver on the data index contract. This means that both Consumers and Indexers are first-class citizens on the SubQuery protocol, coordinating to efficiently allocate their capital to standardize, index and aggregate useful Parachain data.

[11] URL: https://bifrost.finance/.
[12] URL: https://subquery.network/.

Conclusion

Polkadot is a free market for L1s, mediated by a single L0 – the Relay Chain. This Relay Chain is the foundation of Parachain security, empowering each custom blockchain to focus on its unique comparative advantage. Since they can outsource security, they can tailor their chain and deploy resources more effectively, focusing on improved liquidity, UI and community growth.

Since security comes at a cost, Parachains are a scarce resource. They are Polkadot's prime real estate. Candidates must compete to win a slot, convincing the community – the financiers – to stake their DOT and help the project bid for a Parachain. Since the lease expires after some defined period (up to two years), they must do this again and again, ultimately inviting long term actors into the ecosystem and motivating continued innovation.

We are interested in tracking the relationship between economic value on the Parachains and economic value on the Relay Chain (DOT). There are many open questions. How will the economic value of the Parachains be distributed? How will Parachains coordinate with one another? Given their collective destiny, will they be able to effectively collaborate and avoid the tragedy of the commons? Will we see conflict amongst the Parachains akin to conflict between countries with different strategic and political objectives?

How will these chains compete not just amongst themselves, but with the L1s beyond Polkadot? Will Parachains focused on interchain diplomacy (like Moonbeam) be able to successfully create alliances not just with the Parachains, but with the empires that extend beyond the ecosystem (such as Ethereum)? Will we ever see the GDP of a single nation state (a Parachain) surpass the GDP of the collective (the Relay Chain)? Will the outsized success of a particular Parachain create the threat of secession, motivating this chain's break from the L0 union?

What is perhaps the most profound contribution of Polkadot is the way it makes collective security a free market solution. The League of Nations, formed in the aftermath of WW1, eventually failed. Polkadot is the first attempt to decentralize collective security, a scarce resource that can be bought and sold by the open market – ultimately captured by Parachain churn.

We are excited to continue deploying capital not just in emerging Parachains and the tooling that underpins them, but into applications building on each respective L1 (like Moonbeam and Acala). As we head toward a multi-chain world, we will continue to see use cases that are not only increasingly customized, but also increasingly interlinked. This strikes at the core of Polkadot's design philosophy. The project is ultimately an attempt to balance the free market customizability of L1s with the unified internationalism of shared security – *the League of Parachains.*

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