TravelerToken

Travel More. Spend Less.
Rewarding consumers and driving progress.

A collaboration between

travelXite

AIRBLOCK
Built on a bleeding edge distributed system operated by a consortium of travel businesses.

The TravelerToken is a stable currency grounded in real commerce.

The ecosystem it creates will let commercial partners recapture the value they generate.
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Vision
Advances in blockchain technology promise to divest the infrastructure of economic interaction from traditional gatekeepers, who have historically used this privilege to hike fees and insulate their positions. Freed, that infrastructure will quicken an age of liquid global commerce and mutual credit, where collaboration even among competitors will be an essential activity.

Children born in this decade and beyond will wonder why it ever took “2 to 3 Business Days” for a simple transfer of funds, regard physical notes with morbid curiosity, and laugh at the quaint archaism of boom and bust cycles. They will also find the world increasingly connected, physically and economically, and see old barriers to movement dissolve. The advent of budget airlines and ride-sharing apps has already begun the process, making travel more affordable and flexible.

With 1.23 billion travelers and $2.3 trillion in annual turnover, the travel market is at a digital tipping point—with much of its future growth to come from online sources. Yet, as internet penetration rates and increasingly sophisticated marketplaces drive the industry forward, problems stemming from antiquated industry practices threaten to stunt margins and overall hamper short-term growth:

*Inconsistent and costly payment processing*

*Multiple service steps and fees*

*Double bookings and inventory management issues*

*Fragmented listing and rating information across platforms*

*Lots of technical complexity and barriers to interoperability*

*Inadequate personalization of customer experiences*

Individual companies constitute unproductive ‘data silos’. For business across the travel industry, managing data is critical in order to market effectively and service customers. Despite this, travel companies largely lack this capability and are scrambling for solutions.

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1. Online travel market is estimated to generate $1091 billion globally by 2022
2. Ctrip hotel white paper sheds light on hospitality consumer insights
3. Deloitte 2017 Travel and Hospitality Industry Outlook
The formation of a consortium of travel companies utilizing blockchain technology — the TravelerToken ecosystem — will bring the travel industry into the future, both technologically and in terms of rising business practices, creating a shared technical and economic infrastructure that will allow businesses to improve the quality of their services and enables new lines of business through the use of cryptocurrency.

**Improvements:**

- Radically decrease cost of payments
- Prevent double bookings
- Unified ratings and preference sharing scheme with user-controlled data privacy
- Seamless cross-platform service integration and packaging
- Directly reward users in a tangible way
- Establish technical framework for IoT-based services
The TLT Ecosystem
We envision most travel and tourism-related businesses across the globe united in a consortium that uses the TLT distributed system to the mutual benefit of all. The qualifications for membership will be as inclusive as possible but fundamentally designed to ensure the stability and longevity of the consortium. The consortium will be governed by a non-profit legal entity controlled democratically by members and focused on expanding the ecosystem surrounding the industry—emphasizing efficiency, quality, and innovation. It will extend standards to incorporate new emerging trends and technologies, put smaller and larger partners on a more equal competitive footing, and bring the industry into the state of the art.

Consortium members will benefit from nearly free transactions, ability to share user information when given permission, simpler flow for users to book peripheral services by accessing partnered platforms, and the ability to use the TLT application platform for service optimization. This will decrease costs and provide for an integrated travel experience.

We’re developing the technology and proving the economic model for this improved way of doing business. We hope to see other groups of businesses with aligned interests and concerns follow in our footsteps, paving the way for more sustainable global business practices.

Even though cooperation between airlines and hotel booking services has improved substantially with the advent of services like booking.com, Skyscanner, and Trivago, there are a myriad of service and usability issues. The cost of transactions can also be decreased by using blockchain-based transaction settlement systems. A TUI blockchain-based project called BedSwap is a good model for how to structure the resource registries and increase booking volumes.
The TLT Ecosystem

The basis of the ecosystem will be the assets — the goods and services — provided by members of the TLT consortium. A fast peer-to-peer infrastructure will connect existing systems and leverage their data into a searchable peer-to-peer (P2P) network. Each member can decide with fine-grained permissions what data they want to share, with whom, and whether or not it is searchable. But such an infrastructure alone isn’t enough since there is some data that shouldn’t be unilaterally changed.

This is where the ‘blockchain’ part of things comes in. To ensure data integrity and reduce any costs from inconsistency, the ecosystem will provide for a modular multi-chain design flexibly matching the ecosystem and each member’s requirements. The blockchains will be operated collectively across member servers, or in e.g. the cloud if a member desires, and secure shared data. The major difference to existing public blockchains is that the network is composed of trusted peers run by consortium member businesses rather than millions of potentially untrustworthy users. This results in orders of magnitude less resource consumption, higher speeds, and more functionality.

The ‘Standard Asset Registry’ will be designed to secure the credibility and reliability of goods and services offered by members. If any member changes an asset offered to consumers in the TLT system, it would need to go through an official process or else raise an alarm. Similarly, other component chains will store and secure the information of transactions and bookings, customer ratings, customer data, etc. Imagine the system like a private high-speed travel blockchain layer on top of the existing IT infrastructure of the member’s businesses; all together, the system forms a modular, distributed ACID relational database.

The TravelerToken (TLT) will be the standard method of payment in the TLT ecosystem. Transactions, bookings, and related services will operate on top of this financial blockchain. Partnership with Wirecard Bank will allow participating users to load a debit card with TLT and use it anywhere in the world at a location in the Mastercard POS network. Travelers can pay for all their travel needs and even have a convenient option for any sort of payment in local currencies without the hassles of Forex.
The Goals of the Ecosystem

- Establishing a global system for the industry to make travel cheaper and easier
- Reducing the overhead associated with intermediaries and payment settlements
- Providing a blockchain application layer that works seamlessly on top of existing business systems (ERP, CRM, etc.)
- Creating a transparent and auditable system for building trust among the public and members of the consortium
- Allowing for cost effective error management
- Creating a better way to connect businesses to each other and their customers
- Improving customer migration standards
- Giving businesses the tools to keep up with trends and innovate
The TLT Foundation
The foundation will be operated as an independent entity, but its board will be elected democratically by member businesses of the consortium with the sole purpose of fulfilling the objectives prescribed in the charter. It will represent the combined efforts of stakeholders to lift the travel market into the next digital era. It will be funded in part by the Token Reserve set aside from the initial distribution of tokens, committed for the long-term maintenance and development of the ecosystem, and in part by contributions from member businesses.

It is important that the foundation and its charter be carefully designed. However, the foundation is the embodiment of the will of the consortium, and only its eventual members would have authority to decide. Anything else would never be accepted and make the consortium stillborn.

Instead, here we suggest good principles and a design, providing strong arguments. It is essential to maintain the ethical integrity of the board of the TLT-ecosystem. Potential partners will join only when it can be shown that there won't be any conflicts of interest. To prevent the consortium from becoming a cartel, we focus on defining a foundation, with a public charter, an elected board, and administrative team, and inclusive membership for businesses in the consortium.
The TLT Foundation

The one foundation to rule them all

The consortium can use a quasi-federated or a completely decentralized organizational model. The foundation needs to have a clear, unified vision of the projects and proof-of-concepts to be pursued, and a decision-making structure that is swift and promotes the general growth of the foundation. Also important is management of funds and human resources. We suggest adopting the quasi-federated model for two years at least, followed by an eventual transition to a decentralized autonomous organization (DAO).

The administrative team of the foundation will be responsible for the efficient use of funds resulting from any sale of tokens from the TLT reserve. Some basic principles for the foundation:

1. Each member should get a vote on deciding the composition of the principal governing body, the board. As more members join, the board is gradually clustered by sector.

2. The foundation should have an internal administration team to manage the general operations of the TravelerToken Foundation. An independent chief executive should head this administration and the internal technical team of the foundation.

3. A technology council should be established, comprised of the executive of the administration team and short-term collaborators who are nominated by the board each year to help with any projects being undertaken by the foundation. This body is comprised of temporary members and is headed by the executive of the administration team. The technology council decides on and coordinates implementation of directives from the board. The vote from the technology council on issues serves as a tie-breaker or, in the event that a quorum of board members do not present themselves for a vote, the sole decision.

4. During the early days of the foundation, before there are enough members in the consortium proper to elect a board, the technology council will act as an interim governing body.

5. The administrative team will be bound by the rules set forth in the charter of the foundation. The board’s functions will slowly be transitioned to a DAO.
The charter represents the core of the foundation and will clearly state its goals and the means at its disposal. It will be presented publicly. Change requests to the charter will be formulated and finalized by the board. The final approval will be made collectively by owners of TLT tokens, representing the wishes of the market. It is not forbidden for the members of the consortium to maximise their influence by supporting the value of the token.

While the consortium uses a quasi-federated model, the board will be periodically elected by the consortium. One member of the board will be named the temporal chairman and head meetings. The sole purpose of the board is to enforce the charter, support change requests to the charter, and present a face to the public. Salary and term periods will be kept public.

The foundation will always be open to applications from the travel and tourism industry to join the consortium. Every member company will have votes to represent itself proportional to its yearly revenue; the percentage of votes a single company and its affiliates can command in total is capped at 20%. The yearly costs of the foundation, after deducting any funding drawn from the Token Reserve, will similarly be sourced from members proportional to their yearly revenue, capped at 20% of the total budget. This follows the principle that larger members bear more costs and have more to lose, and therefore have a greater say in the direction of the consortium, but without giving too much power to or putting undue burden on any single member.
Technical Considerations
The most widespread and stable blockchain systems, like Ethereum, currently operate using proof-of-work consensus algorithms that limit confirmation times and throughput. Long transaction confirmation times result in delayed responsiveness and low throughput severely limits the type of applications that can be practically implemented. However, even planned upgrades and systems with superior features over these lack the flexibility and efficiency necessary.

This suggests that construction on top of a public blockchain approach is not suitable for the TLT system. Instead, it will consist of a set of interlocking P2P protocols for scalable interaction between consortium members, creating a hybrid semi-centralized system in which partners and end users will enjoy a standard experience insulated from all the complexity under the hood.

It will rely on established principles but allow for strict quality of service guarantees: high throughput, low confirmation times, and high availability can be directly maintained by the consortium members without reliance on potentially uncertain external factors.

To enable highly scalable, low latency, and cost-effective fully decentralized systems and to eliminate the need for semi-centralized approaches, significant future advances will need to be made in blockchain technology. Projects such as TrueBit, the Lightning/Raiden networks, IPFS and Filecoin, Mysterium, and IOTA are steps in that direction. But these are merely the precursors.

The near future will see the rise of IoT and with it pervasive computing, blurring the distinction between devices and the "everyware" network; a single machine will be less a self-contained unit than an interface to a world-spanning computational substrate. Economy of scale is already shipping overpowered chips in consumers appliances, down-clocked to reduce power consumption even where the supply of electricity is fixed. That excess capacity may one day soon find use in powering our daily lives.

The TLT system and others like it are transitionary architectures that will obsolesce as independent systems and will be ported to run on, or perhaps their development will converge toward, the pervasive computational substrate.

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How does the system connect members?

Like all modern P2P networks, the TLT system will establish an efficient routing structure for passing messages between peers. This is done by establishing a virtual routing space that helps to organize the peers and facilitate communication.

Data can be stored by assigning names to both peers and files using the same hash function. If a file is assigned a name that’s very similar to some peer’s assigned name, that peer becomes responsible for storing it. If you’re looking for a file, finding the peer responsible for it is easy! Just pretend the file is a peer and try to contact it; your message will end up being routed to the peer holding the file. However, this method has some drawbacks.

First, data is distributed evenly across all peers; that’s good, except if you don’t want to share data, if the peers don’t all have the same storage capacity, and if the files aren’t all the same size.

Second, assigning names using a hash function destroys semantic information. Older methods of P2P communication, based on message flooding, could support some database search functionality (range queries, predicate searches, -fix searches, etc), but were highly inefficient. Modern structured P2P networks are much more efficient, but have difficulty supporting the same functionality.

That doesn’t mean it isn’t possible. Cutting edge research shows that not only can P2P systems be made to support those features, but also more advanced database functionality such as nearest neighbor search and various aggregates.

There is already the physical network, where messages are actually sent, and the virtual routing space, which just helps to organize how the message should be routed to its destination; we can envision an additional ‘semantic routing space’ where files “talk” to each other. Of course, files can’t talk to each other directly, they must do so using the layers beneath—the virtual routing space between peers and the physical network itself. The messages “passed between files” are multiplexed through the virtual routing space.
Why did four hops in the semantic space result in only three messages in the layers beneath?

Because one peer was storing two of the files along the route. This is illustrative only; one of the most straight-forward optimizations is to allow messages to “cut through” by automatically jumping to the location of another file hosted on the same peer that is closer to the query point.

You might wonder then, how is a peer who isn’t storing files able to perform searches?

Because the semantic space isn’t used to route messages directly; a peer can formulate a reverse K-NN query and send it to other peers, who will use their local information to route it to the proper location.
Technical Considerations

Will it be slower and/or less efficient than centralized solutions?

Using the semantic space results in multiple messages and many hops. This is why it is important to use an ultra-efficient virtual routing space. Since the connectivity of the semantic space is multiplexed through the virtual routing space, both must be very fast since the maximum speed attainable for queries is limited by the slowest between them.

Most current P2P systems use an overlay that scales logarithmically with the number of peers; that is, the average number of hops it takes for a message to reach its destination increases as the logarithm of the number of peers in the network. A few exceptions utilize De Bruijn graph or Distance Halving\(^4\) schemes to achieve sub-logarithmic scaling \([\log(n) / \log(\log(n))]\). A scheme with doubly logarithmic\(^5\) scaling \([\log(\log(n))]\) that supports range queries has been built, although their structure is complex and hand-tuned. In principle, even the theoretical optimal\(^6\) of \([\log(\log(n)) / \log(\log(\log(n)))]\) is not beyond reach\(^7\).

Such scaling is impractical on single machines due to large constant factors and has remained mostly of theoretic interest; in a distributed setting, however, we transition from a processor bound to a network bound regime, where the latency of communication between peers dominates such constants. Here scaling becomes significantly more important. As in most fault tolerant systems, however, the overall space usage of the data structure would be at least super-linear in \(n\log n\), i.e. minimally \(\log n\) storage per peer.

Malkov\(^8\) has recently shown that a hierarchical small worlds graph can be utilized to construct a graph-based nearest neighbor data structure with logarithmic scaling, improving over the polylogarithmic scaling of the previous best Raynet\(^9\). Some nodes are selected for preferential attachment, up to a saturation limit, and organized into layers of increasing connectivity. Queries are then routed in a “zoom-out, zoom-in” fashion.

Most salient, the HNSW method is more than competitive on single machines with a state-of-the-art NNS library (Faiss) released by Facebook in 2016. The HNSW method does use more memory, but in a distributed setting where node connections are already required for routing, the additional overhead will be marginal.

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4 Naor & Wieder, Novel Architectures for P2P Applications - The Continuous-Discrete Approach
5 Sioutas et al, ART: Sub-Logarithmic Decentralized Range Query Processing with Probabilistic Guarantees
6 Beam & Fiche, Optimal bounds for the predecessor problem and related problems
7 Cary, Towards Optimal — Approximate Nearest Neighbor Algorithms in Constant Dimensions
8 Malkov et al, Efficient and robust approximate nearest neighbor search using Hierarchical Navigable Small World graphs
9 Beaumont et al, Peer to peer multidimensional overlays - Approximating complex structures
Figure 1 (Malkov et al): Performance of HNSW on benchmark datasets
The construction of Malkov, however, suffers from uneven load distribution and does not address heterogenous storage capacity. These problems and the earlier mentioned optimization of “cutting through” can best be implemented by making the connectivity of a peer dependent on the magnitude of data it hosts, so that each unit of data incurs a small constant overhead in communication, but searches are sped up significantly as messages will tend to reach high-capacity, and thus high connectivity and high “cut through” value, peers quickly. The assumption here is that exponential growth in storage capacity will be relatively proportional to exponential growth in bandwidth (i.e. the logarithm of the increase in capacity will be proportional to the logarithm of the increase in connectivity and bandwidth usage).

We can establish a tower of routing rings, each representing a declaration of some magnitude of capacity. The capacity a peer’s membership in each ring represents is a power of two of some defined base unit of capacity—up to nearly half that of the highest capacity peer in the system. However, each ring only enforces a capacity of half the declared magnitude. This is so that a peer can insert itself into every ring below as well, each enforcing a capacity adding up geometrically to the correct declared magnitude, resulting in a skip list-like structure. A peer then inserts itself repeatedly into the highest level possible given the remaining capacity until the total sum of declared capacities is approximately equal to its true capacity.
This construction is related to skip-webs\textsuperscript{10}, and therefore skip lists in general. However, these structures only achieve logarithmic scaling. The close relationship between randomized binary search trees and skip lists has been explored\textsuperscript{11}; the efficiency of power-law distribution random graphs is due to their ‘tree-like’ structure; power-law random graphs with exponent $\tau > 3$ have finite variance and asymptotically logarithmic scaling properties. Thus, we may conjecture that skip lists can be considered special cases of a supercritical power-law graph with finite variance, and that this one view of the source of their probabilistic logarithmic performance.

We extend this by assigning every node on each level of the tower of the routing rings with a weight corresponding to the index of that level. We can then use the random intersection model\textsuperscript{12} to generate a graph. Assuming the distribution of nodes of each magnitude of declared capacity follows a power-law, the resulting graph with follow the same power-law distribution to within tunable constants. Most naturally occurring power-law distributions have an exponent $\tau (2,3)$ and it is reasonable to assume the distribution of storage capacities will as well; further, the way peers represent themselves with multiples nodes to account for heterogenous capacity “lengthens” the tail of the distribution. Research\textsuperscript{13} on power-law random graphs with exponent $\tau (2,3)$ has shown them to have a diameter upper-bounded by $O(\log\log N)$.

Preferential attachment models—like the one utilized by Malkov—tend to produce\textsuperscript{14} power-law random graphs with exponent $\tau > 2$. However, the HNSW algorithm only achieves logarithmic performance. This shows the relationship between their approach and ours, and the clear room for improvement.

While we can assume that the distribution of storage capacities will follow a power law, we cannot know what the distribution of attributes—the semantic dimensions—will be and they do affect the analysis of the random intersection graph. A result from Shang\textsuperscript{15} on generalized random intersection graphs will allow us to account for this.

We can represent the weight of each attribute as the number of base units of data that are part of a file tagged with that attribute. As long as this distribution has finite variance, the expected degree distribution will still follow the power-law distribution of the capacity nodes up to tunable constants, but now times the expected value of the variance of the attributes.

A recent improvement over the HNSW algorithm is the Navigating Spreading-out Graph\textsuperscript{16}. Experimental results show superior performance over HNSW, and otherwise confirm HNSW as a close second over other state-of-the-art schemes.

\textsuperscript{10} Arge et al, Skip-Webs - Efficient Distributed Data Structures for Multi-Dimensional Data Sets
\textsuperscript{11} Dean & Jones, Exploring the Duality Between Skip Lists and Binary Search Trees
\textsuperscript{12} Deijfen & Kets, Random intersection graphs with tunable degree distribution and clustering
\textsuperscript{13} Norros & Reittu, On the robustness of power-law random graphs in the finite mean, infinite variance region
\textsuperscript{14} Dommers et al, Diameters in preferential attachment models
\textsuperscript{15} Shang, Degree distributions in general random intersection graphs
\textsuperscript{16} Fu et al, Fast Approximate Nearest Neighbor Search With The Navigating Spreading-out Graph
However, despite its superior performance, its complexity is polylogarithmic. NSG makes up for its base complexity with a host of optimizations. It maximizes clustering, which minimizes the average distance between nodes\(^\text{17}\) and thus improves search speed. However, this also minimizes the out-degree of clusters and would make inter-cluster navigation more difficult. As a result, they direct all outbound links to a navigating node and begin every search from this central point. This has the effect of minimizing the overall average degree of each node, reducing memory costs, without sacrificing connectivity or speed.

However, a purely topological view of networks ignores valuable information; combining a topological view of the network with the weight distribution of edges better models real world networks\(^\text{18}\). Transforming common metrics, such as average degree and average clustering, into their weighted counterparts reveals an interesting duality. In certain types of networks, such as air traffic maps, hub nodes do not have high degree but instead high

\(^{17}\) Barmpoutsis & Murray, Networks with the Smallest Average Distance and the Largest Average Clustering

\(^{18}\) Barrat et al, The architecture of complex weighted networks
weighted degree. The power-law characteristics are satisfied by the high flow through their sparse number of links; we can see the equivalence between graphs that satisfy the power-law characteristics through their degree distribution and those that satisfy the power-law characteristics through their weight distribution or flow by conceptualizing such high-flow links as composed of many links of unit weight (forming a multigraph). This is precisely the duality allowing our approach to have a degree-based semantic search structure multiplexed through a weight-based routing structure.

NSG also make use of this duality. However, the reduction in the average degree of nodes in the NSG algorithm, by replacing the upper-level search structure of HNSW with the central navigating node, comes at the cost of severely increasing the weight of a small number of links. This is acceptable for a single machine, where the weight of a link is irrelevant (since all work is performed by the same machine), but is infeasible for a distributed network, where this would put severe strain on a handful of peers and result in a bottleneck.

NSG is, nonetheless, an excellent candidate for a single machine local NNS structure allowing queries to “cut through” by jumping to the location of another file hosted on the same peer that is closer to the query point.

Our approach can generate a multigraph with a diameter upper-bounded by $O(\log \log N)$ and sped up by the “cut through” mechanism for semantic search, asymptotically leaving the complexity of the base routing as the limiting factor for the speed of queries. This is also upper-bounded by $O(\log \log N)$, but a lower upper bound may eventually be proved by imposing rules on how links are formed (making them semi-random) using a bucketed version of the Distance Halving scheme.

Finally, we may use the Expected-Value Navigation algorithm, which generalizes the routing process as decision making under uncertainty, to allow messages to navigate making use of connectivity information in the multi-level routing space and similarity information imported from the semantic space. In the manner of oblivious ‘electric’ routing, we can further extend the EVN algorithm — as a local estimator of the graph Laplacian — from choosing the best option to choosing each option with a probability weighted by the expected-value. This can increase the average complexity of queries to the worst-case bound, but will result in optimally low congestion across the network according to capacity.

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19 Naor & Wieder, Novel Architectures for P2P Applications - The Continuous-Discrete Approach
20 Simsek & Jensen, Decentralized Search in Networks Using Homophily and Degree Disparity
21 Kelner & Maymounkov, Electric routing and concurrent flow cutting
Can you repeat that more concisely, please?

The routing structure used will outclass all existing P2P architectures. It will be maximally flexible in the sense that no hand-tuning is required, and it will support robust operation over the internet on distributed machines with non-uniform capacity.

Simple queries on a small number of objects will always be faster on a centralized database. But complex ones on a large number of objects could be significantly faster due to the massive parallelism inherent in the system. This would represent a significant amortized speed up over centralized database search, not to speak of the massive improvement in flexibility.

Will the system only be able to perform nearest-neighbor searches?

No, it will support the full range of advanced database functionality. Multi-dimensional NNS has simply shaped the architecture of the system the most and is the primitive supporting exact, range, and -fix queries; various aggregate\(^{22}\) queries will also be supported, and further research will be done to extend the NNS structure to allow for arbitrary predicate queries using a complete relational algebra.

This can be done because highly-clustered nearest neighbors sub-graphs are equivalent to unique element intersection in the random intersection graph model, and these elements represent attributes. Since these clusters then represent some Cartesian product of the attributes, this would allow for the application of formal concept analysis. Any resulting concept lattice is a complete lattice, and therefore a relation algebra can be defined over it\(^{23}\). In order to extend this to non-binary attributes in a robust manner, we may further require that all attributes be mapped in some consistent way into the interval \([0,1]\). Fuzzy FCA\(^{24,25}\) can then be utilized.

This means that, viewed as a distributed database, it will take in semi-structured data and allow for efficient relational querying. With this as a base, the blockchain components of the system can modularly satisfy the ACID properties, allowing users to interface with the system as an ACID relational database.

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22 Kempe et al, Gossip-Based Computation of Aggregate Information
23 Priss, An FCA Interpretation of Relation Algebra
24 Ciobanu & Vaideanu, Similarity Relations in Fuzzy Attribute-Oriented Concept Lattices
25 Belohlavek, Fast factorization by similarity in formal concept analysis of data with fuzzy attributes
If finding a file isn’t done using consistent hashing, how do peers know which other peer hosts some given file?

Using file headers and an IPFS-like interface. Search is done through the connectivity of the semantic space multiplexed through the routing space.

What about data a member doesn’t want to share?

All search and sharing privileges are fully configurable. A member can choose what is searchable and/or shareable.
What about data that shouldn’t be changed by any single member?

That’s where the “blockchain” part of things comes in. Many applications hosted on the TLT system may require this feature. The main two examples are the ‘Standard Asset Registry’ and the TravelerToken itself.

**Standard Asset Registry**

Members declare assets, any good or service offered, according to standardized classes defined by the consortium foundation. An airline might, for instance, make an entry into class “Airplane” with assets “Seats”, governed by rules relevant to that asset class.

Any transaction which modifies assets in a class is processed and recorded in an immutable, append-only list, known colloquially as a “blockchain”. Members can choose which asset class blockchains are relevant to their business model and participate in only those ones.

The state associated with each class is stored in a trie and the set of all classes composes the Standard Asset Registry; each class can be differentiated in the data structure stored locally via a standardized prefix system.

The Merkle root of each trie is periodically entered or “checkpointed” into the TravelerToken blockchain.

**TravelerToken**

The TravelerToken blockchain is critical to the operation of other applications and to the financial well-being of the consortium, therefore every member will participate in its operation.

Eventually, zero-knowledge proofs of valid state transitions will be posted to public blockchains such as Ethereum. These proofs will allow outside parties, with no additional knowledge beside the proofs, to be sure that the token system is running according to the declared rules.

While the TravelerToken will be run by consortium members, outside parties will have access to their TLT via light clients. Valid TLT addresses will only be issued to persons, real or legal, submitting the appropriate KYC information. Financial institutions can use these light clients to operate their services for persons holding or otherwise using TLT. A debit card is already in the works.
How will people use the Standard Asset Registry and the TravelerToken?

A library of basic contracts will be created by the consortium. These can then be composed to create arbitrarily complex bookings/offerings. Each basic contract will have a small cost in TLT associated with it as dictated by the consortium; compositional contracts will simply cost the equivalent of the number of times each basic contract was used in its construction. These fees for the execution of contracts goes to the members of the consortium to subsidize the cost of operating the system, making it feasible for the consortium to extend use of the system to third parties for arbitrary financial applications leveraging the TLT.

This is similar to the scripting languages used on current popular blockchain platforms, except that the basic contracts or ‘scripts’ will be defined in a functional manner allowing for arbitrary composition. These will only be financial in nature.

Contracts which refer to assets in the Standard Asset Registry will need to include digests of Merkle proofs valid to the last “checkpoint” Merkle root of the relevant asset class blockchain. Further, assets that are referred to in contracts will create ‘locks’ on those assets in the relevant blockchains and not allow changes until the contract/s are settled; this is possible because all peers monitor the TLT blockchain.

What are the benefits of this approach? No double-booking or hidden changes. Full transparency even if a customer purchases or rents assets that have been bundled in multiple and complex ways. And this allows automatic settlement of the entire payments chain, no matter how convoluted, upon payment by the end consumer.

This limited functional approach also allows for the eventual streamlined implementation of formal verification techniques.

28 Formal Verification
Technical Considerations

**Is this scaleable?**

Yes. The Standardized Asset Registry is modular and the TravelerToken blockchain will only be used for financial purposes.

Members of the consortium that want to leverage the architecture for more general distributed computation can do so between peers they control or other directly interested parties. While this uses some of the same infrastructure, non-interested parties don’t need to waste resources.

Initially, Redbelly\(^\text{29}\) is the clearest choice for a consensus algorithm; it is the consortium equivalent of the IOTA “tangle”, just stripped of the probabilistic voting (‘mining’) mechanism used to establish mutual exclusion and thereby prevent malicious forking without incurring massive expenditure of resources. In a consortium, this security mechanism is unnecessary, and a more standard quorum-based mutual exclusion mechanism can be utilized. An efficient algorithm for collective signing can then enforce immutability.

Later upgrades will make use of insights gleaned from the gossip-based Hashgraph\(^\text{30}\) algorithm and timeline entanglement in general\(^\text{31}\), but also from academic research such as Mencius\(^\text{32}\) and general work in systematizing the theory of consensus algorithms.

**Is this secure?**

Yes. It is a permissioned network controlled by the consortium foundation. All consortium members will be legally bound by the foundation and users will have to submit KYC information.

**Technical Whitepapers**

The overlay features described above are based upon ongoing research into the development of components necessary for a pervasive computational substrate; a forthcoming paper\(^\text{33}\) will summarize the overlay component of this research.

A formal specification of the combined TravelerToken and Standardized Asset Registry blockchain architecture will be written and released alongside development of the overall TLT system.

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29 Crain et al, (Leader/Randomization/Signature)-free Byzantine Consensus for Consortium Blockchains
30 Baird, The Swirlds Hashgraph Consensus Algorithm
31 Maniatis & Baker, Secure History Preservation through Timeline Entanglement
32 Mao et al, Mencius: Building Efficient Replicated State Machines for WANs
33 Wollang (TBD), Proteus: A Protean Overlay
Economic Considerations
The ultimate test of a currency is reliable redemption for goods and services. While gold offers the euphoric pleasure of caressing shiny metal, and notes make durable bed stuffing, cryptographic tokens are no more than an entry in a distributed ledger and therefore have no value beyond their acceptance in turn for goods and services.

All major cryptocurrencies, lacking any foundation of commercial use, have a value based exclusively in speculation and this contributes to their well-known volatility. While it may be acceptable for pure blockchain businesses to risk such volatility, off-chain companies cannot afford to transact or keep funds in such a medium.

TravelerToken represents a direct obligation on the members of a consortium of travel and tourism-related businesses to provide goods and services to the bearer. More than just a stable currency grounded in real commerce, the distributed system which maintains it further provides for a host of Dapp, smart-contract, and data exchange applications. It is both a technical and economic infrastructure allowing its participants to cooperate in achieving common interests—even when otherwise competitors.

Division of labor is the foundation of the modern economic system. This division presupposes a continuous exchange of services among the divisions if serious business disturbances are to be avoided. That exchange, however, is often gravely impeded. Everywhere exchangeable values and mutual wants abound, but actual exchange can meet with the artificial obstacle presented by a medium of exchange failing in its stated purpose.

When an economy faces a downturn, one hears questions voiced in the spirit of, “Wheat rots in the field, machines idle in the factory. There are things to get done and people to do them. Why can we not simply go out and work?”. Because banks are recalling liabilities and hesitate to give new loans, the stock market has sunken, and overall those with claim to money drain this lifeblood from the commercial organism, hoarding it in whatever asset class their broker has informed them is safest. Money is disconnected from the real value it represents—that of its ability to facilitate real economic interaction.

In our modern economy, money serves to an extent as both a medium of exchange and a store of value. But the notes of a central bank are brittle in achieving their purpose, and the financial instruments linked to them and serving as stores of value are increasingly in the hands of a very few—at levels not seen since the days of the robber barons—whose direct contributions to economic output are vastly less than the sums at their disposal, to be sure.

The macroeconomic policy tools34 employed by central banks are primitive and can affect only the largest scale factors, leading to clumsy and overly broad responses. Some sectors may experience a surge in demand and need more liquidity. Some sectors may experience a reduction in demand and would be harmed by inflationary policy. The needs of a group with largely overlapping business interests and concerns can differ greatly.
from those of another group. Microeconomic policy tools address these inadequacies to some extent, but only to the extent to which prediction is possible. These predictions can only be made with highly noisy, imprecise data and models that often are unfalsifiable. The result is the boom and bust cycles that disproportionately affect the working population responsible for the majority of economic output. It’s a model rooted in the old “industrial age” business mindset, where bludgeoning oversight was considered not only necessary but beneficial.

**The medium of exchange should be governed by possible turnover, not the turnover by the available means of exchange.** TravelerToken is a complementary currency that will solve these problems for its associated consortium, and we envision it as the first of many such consortia of the same nature creating a free market. Instead of attempting to balance a pencil on your fingertip (as a central bank attempts when it employs its primitive tools), a network of these complementary currencies would act like a natural equilibrium-seeking system in which changes in demand are met with automatic changes in the supply as needed by each group and the effects of which diffuse organically.

Further, this system equips the associated economy with a flywheel, so to speak, giving it great forward momentum and actively driving turnover; outside disruptive factors are dampened by its self-stabilizing nature. This is achieved through the novel direct reward system explained later in this section.

**TravelerToken will help to restore the natural relationship, where exchange of services is primary and the medium used to facilitate this is secondary.** Indeed, it may even be anticipated that the increase in the exchange of goods and services will lead to a drop in average prices. This is the power of leveraging technology to create a powerful economic engine, rather than relying on the capricious winds of fortune to fill our sails.

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Economic Considerations

How is TravelerToken a more efficient instrument of exchange?

It puts every member of the consortium (which runs the distributed network underlying the token) on an equal footing in terms of technical infrastructure and access to capital; this encourages competition and thus cheapens exchange.

The TravelerToken secures exchange by providing for the acceleration of exchange. Not by means of some demurrage fee, as was tried a few times at the beginning of the last century, but through the feedback mechanism that generates the tokens for the “cash-back” rewards.

The methods central banks use to adjust the money supply (their “macro tools”) are overly broad. And the methods they use to direct new liquidity where they believe it most helpful (their “micro tools”) are based on predictions that rely on highly noisy data, unfalsifiable models, and that appear to ignore the chaotic tendencies typical of any large-scale system. Even when central banks can achieve an equilibrium, it is an unstable one (like a ball balanced on the peak of a convex dome). As the equilibrium point shifts in response to technological and social change, the central bank must play Sisyphus in its attempts to keep the ball balanced on the peak of that moving dome. The result is cycles of boom and bust.

This system will inflate the supply by creating and directly assigning new tokens to consumers in proportion to the amount they spend. In other words, a consumer receives new tokens in proportion to the amount they spend as a sort of “cashback” reward. The specific proportionality is determined by the overall inflation rate targeted by the system.

The inflation rate targeted by the system will depend on the total turnover of the entire consortium. An optimization algorithm will constantly adjust the inflation rate in order to achieve a specific rate of circulation. That circulation rate (which is equivalent to the total revenue of the consortium) should be approximately the entire token supply every 100 days.

If demand slackens or many parties begin to hoard, the amount of tokens held by those who do not spend will not change, but the proportion of the token supply they hold will shrink. And the amount of purchasing power thus siphoned is immediately reintroduced to those who are, and are most likely to continue, spending.

This system thus achieves some measure of inflationary pressure to spend (by diluting purchasing power), but at the same time also introduces a positive incentive to spend (by rewarding those who do with the new tokens). The net effect is that those who spend regularly redeem the full value of their tokens.

Further, the reward mechanism is only applied to transactions between consumers and the consortium’s members. This creates an asymmetry in which every holder of the token currency experiences depreciation from inflation of the supply, but only those who
spend the token in exchange for the goods and services of a consortium member receive
the reward; **the token can thus act freely as a general currency, but its circulation is
gently and continuously directed back toward consortium members.**

Instead of relying on capricious winds, and fearing the inevitable doldrums, we imple-
ment this system to establish a reservoir of momentum for our economic engine to draw
from, much as a flywheel to a mechanical engine.

A 1998 paper\(^{35}\) released by the IMF suggests that empirical evidence shows a low 2 or
3% inflation rate to encourage growth. Thus, in the unlikely case of stable demand, the
rate will floor at around 1 to 2%. This is equivalent to the targets set by most central
banks, but is in practice a rate far lower than that achievable by fiat currencies—with
the effect that the token’s price in fiat currencies will tend to weakly appreciate in such
circumstances.

\(^{35}\) Ghosh & Phillips, Warning: Inflation May Be Harmful to Your Growth
Economic Considerations

How does the token, as a medium of exchange, achieve elasticity?

It is not only desirable that the token solve the basic problem of “double coincidence of wants”, and that it provide for constant activity, but also that it do so elastically. The problem of “double coincidence of wants” is the problem of asynchronicity of supply and demand; but this asynchronicity is not just a problem between actors, but also for individual actors themselves. Elasticity of a medium of exchange thus reflects the social reality of money, where the ability to incur small debts to others lubricates interaction.

Mutual credit systems provide such elasticity, as independent systems, by extending individuals or businesses a line of credit proportional to their productivity (as measured by income/revenue). This credit is both created and destroyed through exchange of goods and services, and ideally all positive and negative balances in the mutual credit system sums to zero.

Here we provide for elasticity by allowing a consortium member to “draw credit” from the system equivalent to 2 months of their token revenue. There is no deadline for repayment, but the fact that it is inflation-adjusted incentives repayment sooner rather than later. Failure to repay entirely is covered by the legal agreement a business signs when inducted into the consortium. Businesses will be legally obligated to repay such credit in the case that they leave or are kicked out of the consortium.

This elasticity mechanism is further extended to employees of the consortium’s members. An employee can “draw credit” equivalent to 2 months of their token income. There is no deadline for repayment, but the fact that it is inflation-adjusted incentives repayment sooner rather than later. The respective business is responsible for the failure of an employee to repay the credit. It is thus to be expected that an obligation to repay the credit when employment is terminated will be included in employment contracts.

This not only provides for elasticity but incentivizes consortium members to accept as much of their business as possible in the token and their employees to accept at least part of their salary in the token. The more widely the token is accepted, the more stable and useful it becomes.
Economic Considerations

Will the token also be a good store of value?

As a medium of exchange which acts as a substitute in place of goods and services in a transaction, the token should reflect the reality that the value of goods and services degrades over time. This is already accomplished through the adaptive inflation mechanism described in the previous section.

However, one should still be able to give a “sack of wheat” now for the promise of a “sack of wheat” next year or to give a “buckskin suit” now for the promise of a “buckskin suit” next year. There should be a way to store value for later—without dissociating money from its role in facilitating economic activity.

Because, as with every distributed ledger system, there are perfect records of all transactions and knowledge of the state of all accounts, the system can track the amount of inflation precisely. This allows the system to inflation adjust the “credit” described in the previous section; similarly, one can take their excess tokens and loan them out to others at an inflation-adjusted rate.

In other words, a distinction is introduced between the medium of exchange—the token that one uses to pay for something—and the unit of account—the universal measure one uses to keep track of prices and obligations.

There is no need for interest. The benefit one derives from lending is to receive an equivalent amount of purchasing power at later time without incurring losses. This process also ensures that the money is kept in circulation and, therefore, backed by real value. The machines that make things don’t oil themselves and people with specialized skills need to eat every day; there is a cost associated with keeping a sophisticated modern economic system operational, a cost one is ignoring when they think of their money as having value independent of the economic ecosystem backing it.

The technical infrastructure maintained by the consortium (the distributed system running the token) would also allow for very easily constructing and running a consortium-wide credit union to handle investing loan amounts from companies. Alternatively, this same ability can be extended to external parties, who can then handle investing the loan amounts from companies for a service fee. Other more complex financial services using the infrastructure are, of course, possible.
How will the token interact with external markets?

In order to stabilize the token system’s interaction dynamics with external markets, the system will host a smart-contract running a modified version of the Bancor protocol\textsuperscript{36}. This smart-contract will hold a reserve of Ethereum. Initially, this reserve will be 10% of the amount raised in the token sale.

This reserve smart-contract will be interoperable with the Ethereum network and allow traders to make instantaneous trades between the two currencies. This will allow for traders to take advantage of arbitrage opportunities between the exchange price offered by the reserve smart-contract and the exchange price on various cryptocurrency exchanges.

This arbitrage will dampen volatility.

Setting the reserve amount at 10% of the tokens market capitalization is just to ensure the reserve is large enough to absorb shocks. When the economy behind the token increases to a large size relative to the world markets, the consortium might choose to lower the reserve amount.

\textsuperscript{36} Hertzog et al, Bancor Protocol
How does the reserve smart-contract track the desired reserve ratio even though the supply is variable?

By charging a small exchange fee in Ethereum for each exchange made through the reserve smart-contract and adding this to the reserve amount. This fee might be .1% or .3% or even more; what’s important is that we balance some pros and cons.

The fee establishes a floor on the size an arbitrage opportunity must be before traders will be incentivized to perform arbitrage. The higher the exchange fee, then, the less the contract is able to dampen small fluctuations and the fewer trades that will be made (for some given level of volatility).

Thus, the way the smart-contract adjusts its exchange fee must be aware of the current volatility and seek to maximize the fees it can extract from traders. By maximizing the fees extracted, it both encourages trades that dampen volatility to some extent while attempting to fill the reserve up to the desired ratio.

If the reserve is already at or near the desired ratio, the smart-contract exchange fee will asymptotically approach zero. As noted earlier, steady growth in the economy backing the token will allow for a relaxed reserve ratio.
Economic Considerations

How does this relate to a unit of account?

By linking the token to Ethereum via the reserve smart-contract, we essentially make Ethereum the unit of account used by the token. At the beginning, this will result in the exchange price of the token increasing as Ethereum’s price increases.

However, in the long-term, it is desirable to have a very stable unit of account. The Yeager-Greenfield proposal suggests a unit of account based on a bundle of commodities defined broadly enough so that movements in the price of one component of the composite-bundle is likely to be cancelled out by movements in another. In other words, they should be mostly independent so that their composition produces a roughly Gaussian distribution about some mean; uncorrelated changes in this composite are thus “noisy” and tend to cancel each other out.

Stabilization of this mean, or ‘index value’, representing the cost of a unit of the bundle will then amount to general price level stability, and movements in the unit of account prices (i.e. prices denominated in the price of a unit of the bundle) of individual commodities will represent movements in the real prices of the respective goods.

Yeager stresses that two-way convertibility between money and a stand-in redemption medium such as gold—since lugging around a cut of timber, for instance, would be infeasible—is critical to establishing and maintaining the link between the currency and its bundle.

Under such a system, the unit of account is defined independently of any particular medium of exchange and instead is defined by a comprehensive bundle of goods and services. No authority ever has to inject money into circulation (or sometimes withdraw it) to make the supply match the demand at a level compatible with some price-level target. The supply of money accommodates itself to the demand for it at the stable price level corresponding to the definition of the unit of account. The supposed problem of “injection effects” is simply bypassed, as is any need for central forecasting.

Any forecasting tasks that remain are dispersed among competing private money issuers and speculators. Speculation, along with the indirect convertibility of money and the operations of clearing houses and arbitrageurs, keeps the commodity-bundle definition of the unit of account operational. “Macroeconomic entrepreneurs”, as one might call them, will gather information about current or foreseeable aggregate demand and supply shocks and use it in their transactions in securities or other assets. Their activities will help determine market interest rates and a quantity of money consistent with the independent definition of the unit of account.

Here, our initial reserve comprises only Ethereum. But by later shifting the reserve from Ethereum to a basket of so-called “utility tokens”, we can achieve a stable unit of account as Yeager envisioned. These utility tokens will represent the ability to use the services provided by various public distributed networks; ideally, the services would be relatively
universal and in constant demand, such as distributed storage, computation, onion-routing, etc. ...

The universality of the demand for and utility of such tokens in the near future make them quite suitable for the purpose of establishing a stable unit of account bundle. Further, the fact that their value depends on the complex upkeep of communications channels, power facilities, electronics manufacture, et cetera—essentially all major areas of the global economy—means that the effects of random commodity price fluctuations will tend to cancel each other out.
Is this system meant to be unique?

No. If the model is proven effective, many instances of similar token systems may arise wherever there are groups of people with aligned interests and concerns. If a network of these token systems eventually subsumes all global economic activity, then we have achieved a monetary system that adjusts itself as a natural equilibrium-seeking system. Unlike the unstable equilibrium of balancing a ball on a convex dome, we get the stable equilibrium of a ball in the middle of a concave valley. As the equilibrium point shifts in response to technological and social change, the ball is drawn naturally along with it.
Would this evolution not be stymied by governments?

Why should it? On the contrary, the same technology that makes this model possible also allows for reliable and difficult to subvert auditing mechanisms. As long as a government gets its taxes (and now more reliably than before), why should they attempt to keep the power of monetary policy they never should have had in the first place?

“We ought not to be deceived by the fact that today most bank notes are guaranteed as to their value because Governments accept them at their face value in payment of taxes and have thus provided them with the so-called “tax-foundation” (Steuerfundation). The decisive feature, however, is their return to the issuing agency. This return flow is the final guarantee of their utility and therefore of their value.”

Dr. Walter Zander,
Railway Money and Unemployment

A government would still have its own currency whose demand is guaranteed by the obligation to pay taxes in it and supply disbursed through payment of government expenses, but one stripped of its destructive elements.

Just as the currencies of the consortia depend on demand for their goods and services, governments too would find themselves limited in their ability to spend by demand for their goods and services. Is this not a more natural state of affairs?
How will you persuade people to trust you, your platform, and the processes involved in transactions?

The first factor is that although the consortium comprises a group of businesses with aligned interests and concerns, many of them are still competitors. It is difficult in general to get a large group of entities to collude, even more so competitors, and the distributed system run by them inherits this intractability.

The second factor is that the distributed system will be configured to publish zero-knowledge proofs of valid state transitions to public blockchains such as Ethereum. What this means is that the system will publish proofs to a publicly visible, immutable record that it is following certain (self-imposed) rules.

The third factor is that the consortium is made up of businesses and that malfeasance on their part (if they somehow manage to figure out how collude secretly) puts them all in legal jeopardy. There is no anonymity on a private, permissioned distributed system and the legal system can operate as intended.

Economic Whitepaper

A separate paper\textsuperscript{37} will be released describing in full the economic dynamics of the token and providing detailed arguments.

\textsuperscript{37} Wollang (TBD), An Austrian Crypto-token Framework
Token
After the token generation event, all participants will receive ERC20/223 standard tokens on the Ethereum network; this means it has a fixed supply and can be immediately traded on exchanges. During this phase, the token will likely face deflationary pressures and high demand on the market.

When the distributed system of the consortium is ready, these ERC20 tokens can be exchanged on a one-to-one basis for the native token. During this phase, it is likely that the price will increase despite the inflationary mechanism of the system due to the high expected growth in the price of Ethereum (which forms the reserve backing the native token).

When the native token and its consortium reach maturity, the TravelerToken will represent a highly efficient medium of exchange and stable store of value.

The first smart-contract on the TLT native system will implement a modified version of the Bancor protocol as an asynchronous price discovery and stability mechanism. It will hold an ETH reserve equivalent to 10% of the contribution amount and the reserve rate will thus initially be fixed at 10%. Since the token supply increases independently of the reserve amount, the contract will exact a fee ranging between 0 and .3% percent fee in ETH for all conversions made through the smart-contract. This fee is then added to the reserve amount, allowing the contract to track the desired reserve ratio.

The cashback rewards will be powered by a feedback mechanism transparently and autonomously introducing additional liquidity into the ecosystem at a rate proportional to changes in the total turnover of the ecosystem. These cashback rewards will be available to all users who pay in tokens for the goods and services of a consortium member, and may be additionally configured by each vendor through reward contracts.

**Immediate Usage**

TravelerToken can be redeemed immediately after the token sale in two ways:

1. **Partnership with Wirecard Bank will allow participating token holders to obtain TLT debit cards; these cards can be loaded with TLT tokens and redeemed anywhere covered by the Mastercard network.**

2. **In exchange for the cost of goods and services offered by participating early-backer members of the consortium.**
Token Generation
Summary

Name: TravelerToken
Symbol: TLT
Pre-sale: 04/23/2018
Sale: 05/21/2018
Hard Cap: 100.000 ETH
Token Exchange Rate: 1 ETH = 5000 TLT
Minimum Contribution: 0.2 ETH
Contribution Channels: ETH
Accepted Nationalities: Every Nationality, except: United States, Singapore, Socialist Republic of Vietnam, People’s Republic of China or resident of a country where American embargoes and sanctions are in force, namely Iran, North Korea, Syria, Sudan, or Cuba.
Exchanges: We plan to be listed on the largest cryptocurrency exchanges.

EARLY BIRD BONUSES

<table>
<thead>
<tr>
<th>Above 50 ETH</th>
<th>1—50 ETH</th>
<th>Below 1 ETH</th>
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<tbody>
<tr>
<td>30%</td>
<td>20%</td>
<td>15%</td>
</tr>
<tr>
<td>Pre-Sale 04/23—05/20/2018</td>
<td>Public Sale 05/21/2018</td>
<td>Week 2+</td>
</tr>
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</table>

The exact number of tokens generated depends on the amount of funds contributed. Upon reaching the hard cap, the token generation event will end immediately. Tokens will be transferable once the token generation event is completed.
The distribution is proportional to the number of tokens generated through the token generation event; at the end of the token generation event, all tokens generated are considered to be 67% of the total supply. 13% of the supply is allotted to advisors, early supporters, and bounties receivers. The remaining 20% of tokens will be held in the Token Reserve. These tokens will be committed to a fund for the long-term maintenance and development of the TLT ecosystem infrastructure as it evolves into a multi-stakeholder consortium.
Research & Development funds will cover all R&D expenses, including design and development of the hybrid centralized token system.

Sales & Marketing budget will drive expansion of the TLT platform into wider markets and attract the attention of avid travelers and their families from around the world.

Partner Acquisition expenses include legal costs associated with expansion of the TLT ecosystem into various countries and inclusion of new partners into the consortium.

ETH Currency Reserve makes up the reserve used in the asynchronous price discovery and stability mechanism.

Admin, Operations, Founding, Legal costs include the salaries of employees hired to manage the foundation, excluding the R&D team, and expenses incurred in setting up the TLT ecosystem.
**KYC**

We do not accept participation from Restricted Persons and reserve the right to refuse or cancel TLT token generation event participation requests at any time, with sole discretion, when the information provided by the potential participant within the KYC procedure is not sufficient, inaccurate or misleading, or the potential participant is deemed to be a Restricted Person.

**Escrow**

All payments received for TLT tokens in connection with the token generation event will be held in escrow in a multi-signature wallet. The associated keys will stay with members of the TLT team and (trusted third party?), who will oversee and cooperate in the disbursement schedule.

**Recommended Wallets**

In order to participate in the TLT token generation event, a wallet which supports the ERC20 token standard is required. Without one, you will not be able to manage your TLT tokens.

- MetaMask
- Parity
- Mist
Risk Factors
Acquisition of TLT tokens involves a moderate degree of risk. Each potential participant in the TLT token generation event should carefully consider the following information about these risks before she decides to buy TLT tokens. If any of the following risks manifest, the value of TLT tokens could be materially adversely affected. Risks and uncertainties described below may not be the only ones token holders face. Additional risks and uncertainties may also materially adversely affect the value of TLT tokens.

1. RISKS CONNECTED TO THE VALUE OF TLT TOKENS

1.1. Risks Relating to Highly Speculative Traded Price

The valuation of digital tokens in a secondary market is usually highly speculative and not transparent. TLT tokens do not represent or grant any ownership rights to TravelXite’s assets and, therefore, are not backed by any tangible asset. The traded price of TLT tokens in a secondary market can fluctuate greatly within a short period of time. There is a risk that a token holder could lose a substantial portion of her contribution amount as denominated in the traded price. In the worst-case scenario, TLT tokens could be rendered worthless in a secondary market.

1.2. TLT Tokens May Have No Third-Party Value

The TLT tokens may have no third-party value and there is no guarantee of liquidity in a secondary market. TravelXite and their respective past, present, and future employees, officers, directors, contractors, consultants, attorneys, accountants, financial advisors, equity holders, vendors, service providers, parent companies, subsidiaries, affiliates, agents, and representatives (“Company Parties”) are not and shall not be responsible for or liable for the market value, transferability, liquidity, and/or availability of TLT tokens through third parties or otherwise.

1.3. TLT Tokens May Be Non-Refundable

Except for as provided in a legally binding documentation or prescribed by the applicable legislation, Company Parties are not obliged to provide TLT token holders with a refund related to TLT tokens. No promises of future performance or price are or will be made with respect to TLT tokens, including no promise of inherent value, no promise of continuing payments, and no guarantee that TLT tokens will hold any particular value. Therefore, recovery of spent resources may be impossible or may be subject to foreign laws or regulations, which may not be the same as the private law of the TLT token holder.

2. BLOCKCHAIN AND SOFTWARE RISKS

2.1. Blockchain Delay Risk

On architectures currently used for the majority of cryptocurrency transactions (e.g. Bitcoin, Ethereum), the timing of block production and confirmation is determined only in proportion to the ability of the network to solve a cryptographic puzzle (“Proof of Work”), and therefore actual block production and confirmation can occur at random times. For example, cryptocurrency sent as payment for TLT tokens in the final seconds of the TLT token generation event may not be included in that period. The respective platform may not include the participant’s transaction at the time the participant expects.

2.2. Blockchain Congestion Risk

Architectures currently used for the majority of cryptocurrency transactions (e.g. Bitcoin, Ethereum) are prone to periodic congestion during which transactions can be delayed or lost. Individuals may also intentionally spam the network in an attempt to gain an advantage in acquiring cryptographic tokens. That may result in a situation where block producers may not include the participant’s transaction when the participant wants or the participant’s transaction may not be
2.3. Risk of Software Weaknesses

The token smart-contract concept, and the underlying software application and platform, are still in an early stage of development. There are no guarantees or warranties that the processes which maintain the TLT token will be uninterrupted or error-free. There is an inherent risk that the software could contain weaknesses, vulnerabilities, or bugs causing, inter alia, the complete loss of stored cryptocurrency and/or TLT tokens themselves.

2.4. Risk of New Technology

The TLT tokens and all of the matters set forth in this white paper are new and untested. The TLT platform and tokens might not function as intended, and TLT tokens may not have functionality that is desirable or valuable. Participants in the TLT token generation event should not establish any critical reliance on the TLT platform, the token smart-contract, or the ability to receive TLT tokens associated with the TLT platform in the future.

3. SECURITY RISKS

3.1. Risk of Loss of Private Keys

TLT tokens may be held by a token holder in her digital wallet, which requires a private key, or a combination of private keys, for access. Accordingly, loss of requisite private keys associated with such token holder’s digital wallet will result in loss of contained TLT tokens and/or access to on-chain records of transactions. Moreover, any third-party that gains access to such private keys, including by gaining access to login credentials of a hosted wallet service the token holder uses, may be able to misappropriate the token holder’s TLT tokens.

3.2. Lack of Token Security

TLT tokens may be subject to expropriation and/or theft. Hackers or other malicious groups or organizations may attempt to interfere with the token smart-contract which administers the TLT tokens in a variety of ways, including, but not limited to, malware attacks, denial of service attacks, consensus-based attacks, Sybil attacks, smurfing, and spoofing. Furthermore, there is the risk that Ethereum smart contracts may contain unintentional bugs or weaknesses which may negatively affect the TLT tokens or result in the loss of TLT tokens, the loss of ability to access or control the TLT tokens. In the event of such a software bug or weakness, there may be no remedy and holders of the TLT tokens not guaranteed any remedy, refund or compensation.

3.3. Attacks on Token Smart Contract

The blockchain used for the token smart contract which creates the TLT tokens is susceptible to mining attacks, including double-spend attacks, majority mining power attacks, “selfish-mining” attacks, and race condition attacks. Any successful attacks present a risk to the token smart contract, expected proper execution and sequencing of the TLT token transactions, and expected proper execution and sequencing of contract computations.

3.4. Failure to Map a Public Key to Participant’s Account

Failure of a participant in the TLT token generation event to map a public key to such participant’s account may result in third parties being unable to recognize the participant’s TLT token balance on the Ethereum platform when and if they configure the initial balances of a new platform based upon the TLT platform.
3.5. Risk of Incompatible Wallet Service

The wallet or wallet service provider used for the acquisition and storage of TLT tokens must be technically compatible with TLT tokens. Failure to assure compatibility beforehand may result in the participant being unable to access her TLT tokens.

4. RISKS RELATING TO PLATFORM DEVELOPMENT

4.1. Risk Related to Reliance on Third Parties

Even if completed, the TLT platform will rely, in whole or partly, on third parties to adopt and implement it and to continue to develop, supply, and otherwise support it. There is no assurance or guarantee that those third parties will complete their work, properly carry out their obligations, or otherwise meet anyone’s needs, all of which might have a material adverse effect on the TLT platform.

4.2. Dependence of TLT Platform on Senior Management Team

Ability of the management team which is responsible for maintaining competitive position of the TLT platform is dependent to a large degree on the services of each member of that team. The loss or diminution in the services of members of respective senior management team or an inability to attract, retain and maintain additional senior management personnel could have a material adverse effect on the TLT platform. Competition for personnel with relevant expertise is intense due to the small number of qualified individuals, and this situation seriously affects the ability to retain its existing management and attract additional qualified management personnel, which could have a significant adverse impact on the TLT platform.

4.3. Dependence of TLT Platform on Various Factors

The development of the TLT Platform may be abandoned for a number of reasons, including lack of interest from the public, lack of funding, lack of commercial success or prospects, and departure of key personnel.

4.4. Lack of Interest to the TLT Platform

Even if the TLT platform is finished and adopted and launched, the ongoing success of the TLT platform relies on the interest and participation of third parties like travel companies. There can be no assurance or guarantee that there will be sufficient interest or participation in the TLT platform.

4.5. Changes to the TLT Platform

The TLT platform is still under development and may undergo significant changes over time. Although the project management team intends for the TLT platform to have the features and specifications set forth in this White Paper, changes to such features and specifications can be made for any number of reasons, any of which may mean that the TLT platform does not meet expectations of holder of the TLT tokens.

4.6. Risk Associated with Other Applications

The TLT platform may give rise to other, alternative projects, promoted by unaffiliated third parties, under which the TLT token will have no recognition or value.

4.7. Risk of an Unfavorable Fluctuation of Cryptocurrency Value

The proceeds of the generation event of the TLT tokens will be denominated in cryptocurrency, and may be converted into other cryptographic and fiat currencies. If the value of cryptocurrencies fluctuates unfavorably during or after the TLT
token generation event, the project management team may not be able to fund development, or may not be able to develop or maintain the TLT platform in the manner that is intended.

5. RISKS ARISING IN COURSE OF COMPANY PARTIES’ BUSINESS

5.1. Risk of Conflicts of Interest

Company Parties may be engaged in transactions with related parties, including respective majority shareholders, companies controlled by her or in which she owns an interest, and other affiliates, and may continue to do so in the future. Conflicts of interest may arise between any Company Party’s affiliates and respective Company Party, potentially resulting in the conclusion of transactions on terms not determined by market forces.

5.2. Risks Related to Invalidation of Company Parties Transactions

Company Parties have taken a variety of actions relating to their business that, if successfully challenged for not complying with applicable legal requirements, could be invalidated or could result in the imposition of liabilities on respective Company Party. Since applicable legislation may subject to many different interpretations, respective Company Party may not be able to successfully defend any challenge brought against such transactions, and the invalidation of any such transactions or imposition of any such liability may, individually or in the aggregate, have a material adverse effect on the TLT platform.

5.3. Risk Arising from Emerging Markets

Company Parties or some of them may operate on emerging markets. Emerging markets are subject to greater risks than more developed markets, including significant legal, economic and political risks. Emerging economies are subject to rapid change and that the information set out in this White Paper may become outdated relatively quickly.

6. GOVERNMENTAL RISKS

6.1. Uncertain Regulatory Framework

The regulatory status of cryptographic tokens, digital assets and blockchain technology is unclear or unsettled in many jurisdictions. It is difficult to predict how or whether governmental authorities will regulate such technologies. It is likewise difficult to predict how or whether any governmental authority may make changes to existing laws, regulations and/or rules that will affect cryptographic tokens, digital assets, blockchain technology and its applications. Such changes could negatively impact the tokens in various ways, including, for example, through a determination that the tokens are regulated financial instruments that require registration. Company may cease the distribution of the TLT tokens, the development of the TLT platform or cease operations in a jurisdiction in the event that governmental actions make it unlawful or commercially undesirable to continue to do so.

6.2. Failure to Obtain, Maintain or Renew Licenses and Permits

Although as of the date of starting of the TLT token generation event there are no statutory requirements obliging Company to receive any licenses and permits necessary for carrying out of its activity, there is the risk that such statutory requirements may be adopted in the future and may relate to any of Company Parties. In this case, Company Parties’ business will depend on the continuing validity of such licenses and permits and its compliance with their terms. Regulatory authorities will exercise considerable discretion in the timing of license issuance and renewal and the monitoring of licensees’ compliance with license terms. Requirements which may be imposed by these authorities and which may require
any of Company Party to comply with numerous standards, recruit qualified personnel, maintain necessary technical equipment and quality control systems, monitor our operations, maintain appropriate filings and, upon request, submit appropriate information to the licensing authorities, may be costly and time-consuming and may result in delays in the commencement or continuance of operation of the TLT platform. Further, private individuals and the public at large possess rights to comment on and otherwise engage in the licensing process, including through intervention in courts and political pressure. Accordingly, the licenses any Company Party may need may not be issued or renewed, or if issued or renewed, may not be issued or renewed in a timely fashion, or may involve requirements which restrict any Company Party’s ability to conduct its operations or to do so profitably.

6.3. Risk of Government Action

The industry in which Company Parties operate is new, and may be subject to heightened oversight and scrutiny, including investigations or enforcement actions. There can be no assurance that governmental authorities will not examine the operations of Company Parties and/or pursue enforcement actions against them. All of this may subject Company Parties to judgments, settlements, fines or penalties, or cause Company Parties to restructure their operations and activities or to cease offering certain products or services, all of which could harm Company Parties’ reputation or lead to higher operational costs, which may in turn have a material adverse effect on the TLT tokens and/or the development of the TLT platform.

6.4. Risk of Burdensomeness of Applicable Laws, Regulations, and Standards

Failure to comply with existing laws and regulations or the findings of government inspections, or increased governmental regulation of Company Parties operations, could result in substantial additional compliance costs or various sanctions, which could materially adversely affect Company Parties business and the TLT platform. Company Parties operations and properties are subject to regulation by various government entities and agencies, in connection with ongoing compliance with existing laws, regulations and standards. Regulatory authorities exercise considerable discretion in matters of enforcement and interpretation of applicable laws, regulations and standards. Respective authorities have the right to, and frequently do, conduct periodic inspections of any Company Party’s operations and properties throughout the year. Any such future inspections may conclude that any Company Party has violated laws, decrees or regulations, and it may be unable to refute such conclusions or remedy the violations. Any Company Party’s failure to comply with existing laws and regulations or the findings of government inspections may result in the imposition of fines or penalties or more severe sanctions or in requirements that respective Company Party cease certain of its business activities, or in criminal and administrative penalties applicable to respective officers. Any such decisions, requirements or sanctions, or any increase in governmental regulation of respective operations, could increase Company Parties’ costs and materially adversely affect Company Parties business and the TLT platform.

6.5. Unlawful or Arbitrary Government Action

Governmental authorities may have a high degree of discretion and, at times, act selectively or arbitrarily, without hearing or prior notice, and sometimes in a manner that is contrary to law or influenced by political or commercial considerations. Moreover, the government also has the power in certain circumstances, by regulation or government act, to interfere with the performance of, nullify or terminate contracts. Unlawful, selective or arbitrary governmental actions have reportedly included the denial or withdrawal of licenses, sud
den and unexpected tax audits, criminal prosecu-
tions and civil actions. Federal and local govern-
ment entities have also used common defects in
matters surrounding token generation events as
pretexts for court claims and other demands to
invalidate or to void any related transaction, often
for political purposes. In this environment, Com-
pany Parties’ competitors may receive preferen-
tial treatment from the government, potentially
giving them a competitive advantage over Com-
pany Parties.
TravelerToken

Travel More. Spend Less.
Rewarding consumers and driving progress.

A collaboration between

travelXite

AirBlock