Fr8 Token Whitepaper

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1 Introduction

While container shipping changed how physical goods moved about our globe, Fr8 Network is positioned to change how goods are moved through information systems. Every major shipping company manages their business through software. Most organizations maintain their own internal system of record, making coordination without significant data manipulation very difficult.

Blockchain technology is bringing about a new renaissance in coordination for supply chains. An immutable, trusted and secure ledger, blockchain databases are perfectly positioned to connect the fractured supply chains over a standardized information set. Just as the standardization of shipping documents like the Bill of Lading and Waybills allowed clearer terms of communication along a supply chain, blockchain ledger networks will provide standardized ways of accounting for supply chain transactions over information systems.

The Fr8 Network is a set of applications, services, and protocol specifications backed by blockchain technology, built to bring visibility, automation, and trust into the logistics ecosystem. Access to these tools will be modular and pricing schemes diverse. To start, the Fr8 Token will provide users access to software at a discount. Acting as a "smart coupon," Fr8 Token follows the standard discount token model summarized below.

This paper is designed to give a perspective on the Fr8 Token's usage within a sample set of Fr8 Network applications.

Disclaimer: The nature and function of the Fr8 Token is subject to change. Digital assets such as these can be employed in the logistics ecosystem in myriad ways. While Fr8 Network uses tokens as described below, we expect enterprising and creative organizations to use this digital asset in unique scenarios. Our Token does not constitute an investment. There are crypto coins or tokens in the market that either explicitly or implicitly are intended to have features characteristic of securities and that promise or that are intended to provide a return to investors in a manner comparable to the types of returns expected by equity investors. Our Token, however, is not such an investment. Our Token was created and exists in order to provide holders discounted access to services provided by Fr8 Network.

2 Fr8 Discount Token Model

"In brief, discount tokens are digital assets that give their holders a limited right to receive discounts on purchases of products or services from

an organization – a company, a coop, or a blockchain network[1]".

In context of the Fr8 Network ecosystem, the Fr8 Token provides discounted, and at best free, access to services on the platform. Discount tokens follow a structure that can be defined as so:

Given the price per unit of service c, we define the cost of services C

$$C(t, y; X) = c \times y \times (1 - f(t, y; X)),$$

where t is the number of discount tokens activated, y is the quantity or level of service purchased by the user during the license period, and X denotes the global network state or any material characteristics thereof. The function $f(t, y; X)$ is the component of the model called the discount function. It is assumed that f is formulated in such a way that C is always nonnegative, that is, discounts never turn into profits. Consequently, it is assumed that there is a value $t_{max}(X)$, such that $t \leq t_{max}(X)$, which limits the ability of the user to activate tokens[1].

The cost of using Fr8 Network services (like the Fr8 Protocol APIs or the Fr8 Marketplace) is a function of the amount of individual services consumed, the amount of Fr8 Token the user deposits into a license smart contract, and the total ecosystem service usage and token deposits. As more tokens are enabled in the ecosystem and subsequently more services are demanded by the ecosystem, the same number of tokens will access a greater number of features.

In a discounted token model it is possible to receive free access to services in the Fr8 Network ecosystem. Early users of the Fr8 Network suite of products will see increases in the amount of services a single unit of Fr8 Token provides. Should their demand for services be stable as the Fr8 Network grows, the excess token can be sold off to new users seeking discounts on logistics services in the Fr8 Network ecosystem.

3   Fr8 Network Business Model

Fr8 Network is is supporting two main products that work well with the discount token model.

> "The discount token model is applicable to a broad range of business models. Businesses that most benefit from it are those that... desire and expect significant long-term business from its customers through ongoing subscriptions, recurrent fees, or frequent repeat purchases[1]."

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[1]`https://images.sweetbridge.org/main/WP-Sweetbridge-Discount-Tokens.pdf`

The first product Fr8 Network is building is a full-featured software suite called the Fr8 Marketplace. This marketplace will be accessed through software licenses purchased in recurring monthly and yearly subscriptions. Pricing for the marketplace is competitive with that of other industry marketplaces which average $35 per month per user.

The Fr8 Marketplace is the first platform built on top of Fr8 Network's second product, the Fr8 Protocol. This protocol will be accessible through a suite of powerful and scalable APIs. It is designed to service the logistics life cycle of a product moving through a supply chain and includes APIs to record and read data about location, temperature, relevant documents, payment status, and more. Access to the protocol will be billed by transaction volume and total storage and is competitive with that of standard cloud-based platforms.

As the Fr8 Protocol and Marketplace mature, new features will be added. Fr8 Network will offer "al la carte" access to these features to give businesses exactly what they need.

4   How the Fr8 Token is Consumed

The Fr8 Token will be used as a way of offsetting the total cost of services for a user of the Fr8 Network. Users will hold profiles in the Fr8 Network. That profile will be associated to a smart contract on the public blockchain responsible for the Fr8 Token accounting. When a user signs up for a Fr8 Network service like the Marketplace license or API licenses, they will be shown a pricing model that is denominated in Fr8 Token and their preferred fiat currency.

If a user has Fr8 Token, they may deposit any percentage of token the license requests up to 100%. If the user deposits an amount below the total Fr8 Token cost indicated, the remaining balance will come out of the user's fiat payment system like a credit card or PayPal.

A diverse number of user types are expected in the Fr8 ecosystem. A subset will be described in this document:

User Type	Description	License Required
Logistics Software Developer	A programmer at a company that develops and maintains software for the logistics industry, i.e. WMS, TMS, YMS, ERP, and more.	Fr8 Protocol license
Shipper	A manufacturer or distributor of products that will purchase capacity on a marketplace.	Fr8 Marketplace license
Carrier	An asset-based provider of capacity via trucks, rail, vessel, and air.	Fr8 Marketplace license

Table 1: A description of the main users of Fr8 Token.

The following are a few examples of the Fr8 Token being used in the ecosystem. Shown are three personas: Darlene who represents a Logistics Software Developer, Sergey who represents the typical Shipper, and Corbin who represents the typical Carrier. The same services offered and consumed are demonstrated over two time horizons, illustrating the change in the number of tokens required to receive the same level of service as the network grows.

Note: Costs are for illustration purposes only and do not reflect the actual price.

5 Personas and User Stories

5.1 Sergey Shipper

Sergey is responsible for the logistics department at a major interior design firm, Good Design. His employer sells whole-home decor solutions for high net worth individuals. His interior designer just submitted him a purchase order for a 12,000 square foot house with 10 rooms of furniture and accessories to be provided to their new customer in Los Angeles. Sergey orders all of the couches, beds, lamps, chairs, tables, rugs, and accessories to their distribution center outside of Chicago. The warehouse manager tells him everything is palletized and ready to go, signaling Sergey to log into his Fr8 Network account and arrange to deliver the furniture to

the customer in Los Angeles. Because of the size, value, and sensitive deliver schedule of the order, Good Design uses the Fr8 Marketplace for booking freight, contracting with drivers, and tracking shipments. Sergey elects to have the shipment picked up the next day and dropped off in LA three days later.

The price breaks down as follows:

Service	$ Cost (t)	Token Cost (t)
Monthly Fr8 Network FTL Marketplace Membership	$15	50
Shipping Cost	$3100	-
Total	$3115	-
Total w/ Tokens	$3100	50

Table 2: The cost of Fr8 Network services at the initial time of signup plus the shipment costs.

Sergey holds a fixed 50 tokens per month in his Fr8 Network account as a requirement for 100% cost coverage for the Fr8 Network Marketplace membership. Sergey prefers to contract with truckers directly and as such uses the features of the Fr8 Network Full Truckload (FTL) Marketplace. The service charges $15 per month, but to offset that charge he can stake the 50 Fr8 Token.

Assuming he has the requisite tokens, Sergey deposits the 50 tokens to license the software for the month. His tokens are locked into a smart contract uniquely created for Sergey on a public blockchain. Those tokens will be released into Sergey's account at the conclusion of the monthly license period.

Meanwhile, the shipping cost of $3100 gets paid out to the carrier through the credit card on file for Sergey upon notice of delivery acceptance in Los Angeles.

5.2 Corbin Carrier

Corbin is the dispatcher for a trucking company. The company that Corbin works for has 50 trucks, making his organization larger than 97% of all US trucking companies. His job is to make sure his drivers are always on the road earning a wage. Coordinating all of those trucks is challenging and the tools he was using before Fr8 Network restricted him from maximizing his driver's time.

The Fr8 Marketplaces gives him a way to post his driver's availability and to bid on loads. He also found that his history of hiring only the best drivers would allow him to bid for premium loads thanks to his excellent customer service record, a feature unique to the Fr8 Marketplace.

Corbin reads up on the Fr8 Token during signup and decides to buy 25 tokens after registering his payment details. With the discount tokens in his wallet on Fr8 Network, Corbin starts using the Fr8 Network FTL Marketplace to list his capacity.

Corbin can expect a monthly price breakdown as follows:

Service	$ Cost (t)	Token Cost (t)
Monthly Fr8 Network FTL Marketplace Membership	$15	45
Tokens Deposited	-	25
Total w/ Tokens	$7	25

Table 3: The cost of Fr8 Network services at the initial time of signup for Carriers.

To offset the cost of his monthly membership, Corbin would need to stake 45 tokens to his profile-specific smart contract. However, Corbin only has 25 tokens to deposit for the month, bringing his price down to $7.

5.3 Darlene Developer

Darlene has created a useful mobile app for Customs agents at the border to check on the status of a trucks moving through the checkpoints. Having seen the challenge of slow border crossing due to manual document validation, she wanted to give customs and border patrol access to the data they need to speedily approve drivers for crossing.

Darlene knows that the lifecycle of a shipment is captured and stored in the Fr8 Protocol. All data needed to build her mobile application is available, she just needs various permissions to access the data for display in the app when an agent needs to view it.

The Fr8 Protocol developer ecosystem has a number of great tools for Darlene to incorporate into her app. For now, she her app only needs to read document data for display to a customs agent. She creates a developer account on the Fr8 Protocol and selects the data points she needs. These include location data to predict when the driver is arriving, document data like the bill of lading and commercial invoice, plus a few more. The interfaces she will need access to include the Query interface, the Inspection interface, the Transit Data interface and the Document interface, of which her corresponding API key will provide her.

API access and her profile on the developer ecosystem will require a small membership fee. Similar to how a developer profile on the Apple ecosystem charges a

yearly subscription. As her app usage grows, she will also be paying for the amount of transactions her app generates.

Darlene's costs per month can be broken down like this:

Service	$ Cost (t)	Token Cost (t)
Fr8 Protocol API Membership	$1.99	10
Fr8 Protocol Transaction Cost	$0.01	.001
Total without tokens (assuming 20 transactions)	$2.19	-
Total w/ Tokens	$0	10.02

Table 4: The cost of Fr8 Protocol API membership and per-transaction costs for a Developer.

Because her app is not widely used yet, Darlene has a very low bill for her transactions. In this example she performed 20 transactions which net her a $0.20 API usage cost. For her to offset all of these expenses she would need to deposit 10.02 Fr8 Token to her developer profile smart contract.

5.4   After Network Growth

Sergey, Corbin, and Darlene have been using the Fr8 Network for a year now to operate their businesses. Over this time, the network has grown significantly - new members sign up daily to list capacity, bid on contracts, coordinate movement, and more. Checking back in, and assuming the same level of service usage for both Sergey and Corbin, the discount token model automatically adjusts the required tokens needed to offset the service costs.

Sergey continuing to use the FTL marketplace will see a reduction in the number of Fr8 Tokens needed to receive free services. The prior expense of 50 Fr8 Token has been reduced because of discount token formula.

Service	$ Cost (t)	Token Cost (t)
Monthly Fr8 Network FTL Marketplace Membership	$15	40
Shipping Cost	$3100	-
Total	$3115	-
Total w/ Tokens	$3100	40

Table 5: The cost of Fr8 Network services after network growth plus the shipment costs.

Corbin also benefits from this network growth. Previously his membership fee cost him 45 Fr8 Token. Without doing anything besides maintaining his business over a year, Corbin's 25 original tokens get him a higher discount on his membership costs.

Service	$ Cost (t)	Token Cost (t)
Monthly Fr8 Network FTL Marketplace Membership	$15	38
Tokens Deposited	-	25
Total w/ Tokens	$5.50	25

Table 6: The cost of Fr8 Network services after network growth for Carriers.

Darlene's application user base has steadily been growing. As a result, her transaction count has multiplied. She is now required to stake more token if she wishes to have all her transactions covered for free. However, the number of application service providers has grown too, which reduces the cost of the API membership. The discount token model has reduced her per-transaction cost using Fr8 Token by 20%.

Service	$ Cost (t)	Token Cost (t)
Fr8 Protocol API Membership	$1.99	8
Fr8 Protocol Transaction Cost	$0.01	.0008
Total without tokens (assuming 20 transactions)	$3.99	-
Total w/ Tokens	$0	10.16

Table 7: The cost of Fr8 Protocol API membership and per-transaction costs for a Developer after network growth and adoption.

6 Conclusion

The Fr8 Token follows a discount token model, giving service providers and service consumers in the Fr8 Network ecosystem a means of offsetting costs. It is structured in a way that gives early adopters access to an increasing number of services as the network grows - encouraging long term holding of the token.

Over time, the token is expected to vary in its utility within the network. For example, the team is examining the possible use of the token to stake against quality of service as provided by ecosystem members. In this case, if a carrier does not perform against contractual agreements they will have a penalty levied against a service bond held on-chain.