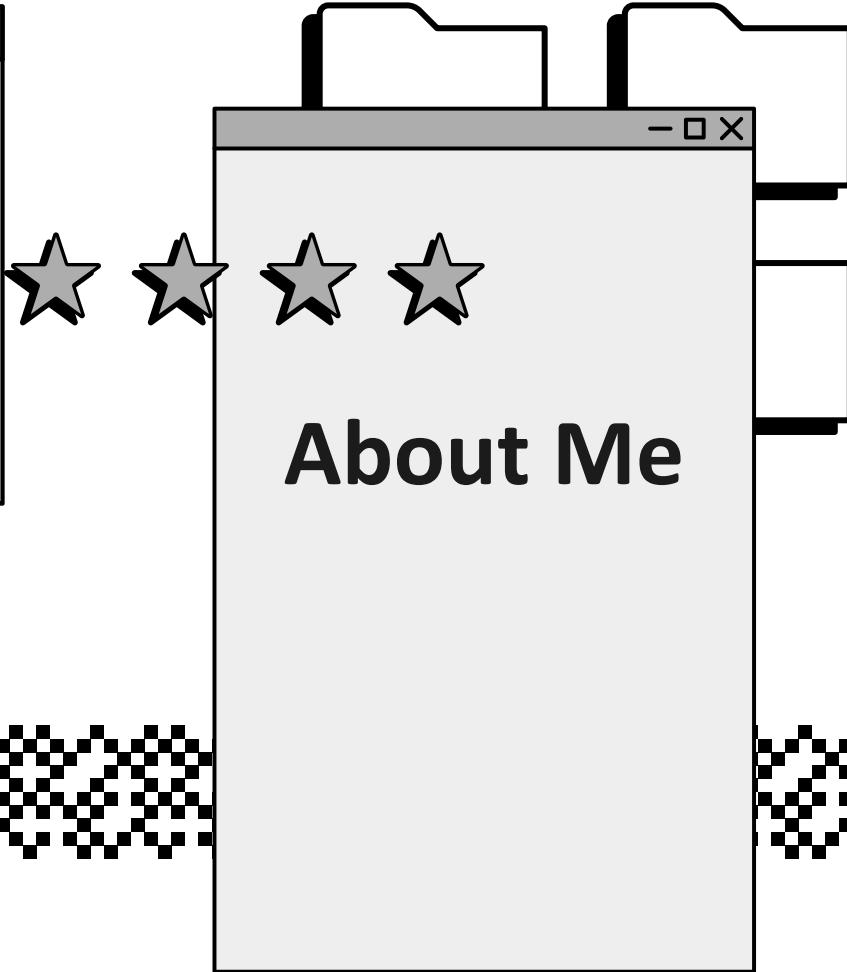
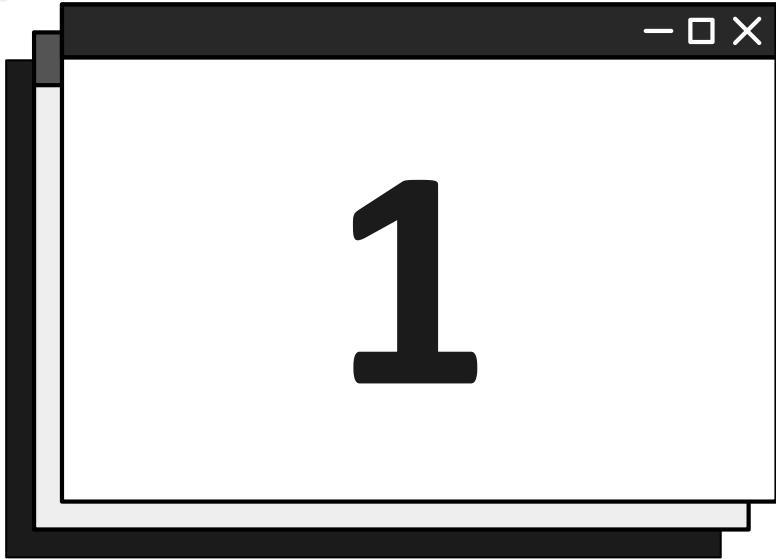


TOKEN TICKETS

A Web3 Event Ticketing Service

Jackson Thetford





Jackson Thetford

Education

Rice University

Master of Engineering Management, Financial Engineering

University of Texas at Austin

B.S. Computational Engineering, B.S Biochemistry, May '24 Graduate

Experience

Software Engineering Intern

Texas Advanced Computing Center

Software Engineering Intern

SGX3

Various Crypto/Blockchain and FinTech classes





Token Tickets

I'm a huge music and sports fan. I love live music and live sports.

As an undergraduate at the University of Texas, living in Austin, Texas (the “Live Music Capital of the World”), I got to see the Texas Longhorn Football Team win on Saturday afternoons and live music on Saturday nights.

However, when I left Austin and the local, small-scale events, I ran into a problem...



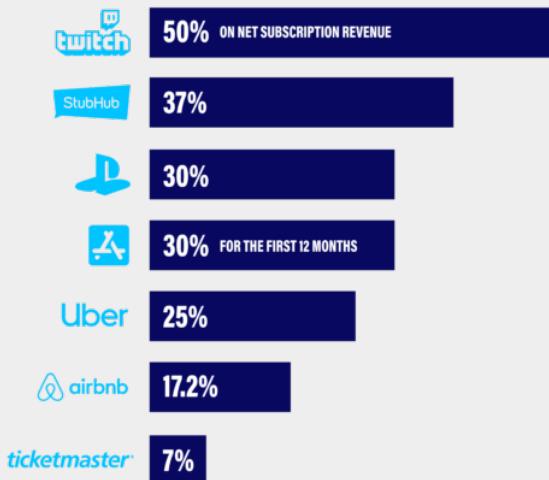


Token Tickets

COMMISSION RATES

OF DIGITAL MARKETPLACES

STANDARD FEES CHARGED FOR DISTRIBUTION



Why do concert tickets now cost as much as a games console?

22 September 2024

Mark Savage Charlotte McDonald
Music Correspondent BBC News

Share Save

NOTE
The real reason it costs so much to go to
a concert
We can't just blame Ticketmaster and scalpers.

Explainer: Why U.S. concert tickets are so
expensive

America's Battle Against Hidden Fees





Token Tickets

America's Battle Against Hidden Fees

“Hidden Fees” are a result of the current centralized ticketing system where peer-to-peer ticketing is impractical.

These fees are up to the discretion of the large and few centralized ticketing entities, like TicketMaster, StubHub, SeatGeek.

It's not Taylor Swift or the Dallas Cowboys charging these fees.

Imagine the possibility of peer-to-peer ticketing transactions for all events...





Token Tickets

Token Tickets is a **decentralized event ticketing platform** that leverages Hedera's Hashgraph Token Service to issue tickets as NFTs. These NFTs are transferable and provide transparent and trustless ticket authentication and ownership, reducing the risk of counterfeit tickets, lowering ticketing fees, resolving transactions quickly.

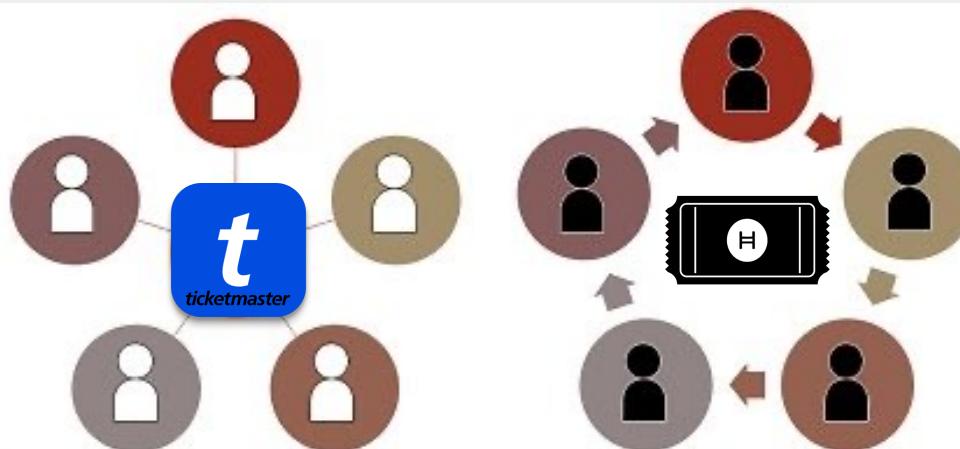
Token Tickets provides a transparent, Event-to-Consumer Network





Jackson Thetford

- This is a classic application of Blockchain and Distributed Ledger Technology. However, in the ticketing world this has yet to be perfected



CENTRALIZATION Vs DECENTRALIZATION



2



Project Summary



Token Tickets

Why Choose Token Tickets?

Global Access

Manage your assets from anywhere in the world, anytime.

Secure Transactions

Your data and transactions are protected with state-of-the-art security protocols.

Fast & Reliable

Experience lightning-fast speeds and seamless reliability.

Transparency

All tickets are securely issued on Hedera's next-gen blockchain.

Fraud Prevention

Prevent counterfeit tickets with secure NFT-based tokens.

Seamless Transfers

Transfer tickets quickly, securely, and effortlessly.





Token Tickets

Objective

- Create a decentralized application for event ticketing

Tech Stack

- **Hedera Hashgraph:** Used for the issuance of NFTs (using Hedera Token Service), for secure, fast, and low-cost transactions.
- **Frontend:** Built using **React.js**, providing a responsive and user-friendly interface. Javascript, Typescript, HTML, CSS, Bootstrap
- **Backend:** Powered by **Node.js** with **MongoDB** as the database for storing event and ticket data.
- **Wallet Integration:** **HashPack** wallet for protected user interactions.
- **DevOps Tools:** Git, Jest, Nginx, PM2, SSL, npm





Token Tickets

Features

Home screen offers overview of application, and information about Hedera's network, and users can connect to the dApp through walletconnect.

The screenshot shows the homepage of tokentickets.tech. At the top, there is a navigation bar with three dots on the left, followed by the title "Token Tickets" and a purple "Connected" button. Below the navigation bar, the main content area features a large heading "A new way to **Ticket**" with the subtitle "Event tickets anytime, anywhere." Below this, there are two buttons: "Learn More" and a purple "Launch App" button. A section titled "Secure NFT-Based Event Ticketing" includes a description of the platform's security and a graphic of a ticket stub with a "H" logo. At the bottom, there is a section titled "Why Choose Token Tickets?" with three boxes: "Global Access" (Manage your assets from anywhere in the world, anytime.), "Secure Transactions" (Your data and transactions are protected with state-of-the-art security protocols.), and "Fast & Reliable" (Experience lightning-fast speeds and seamless reliability.).

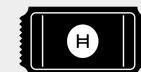
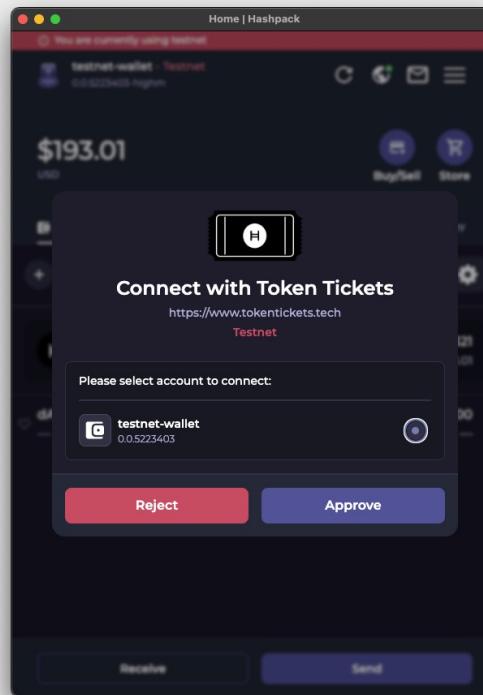
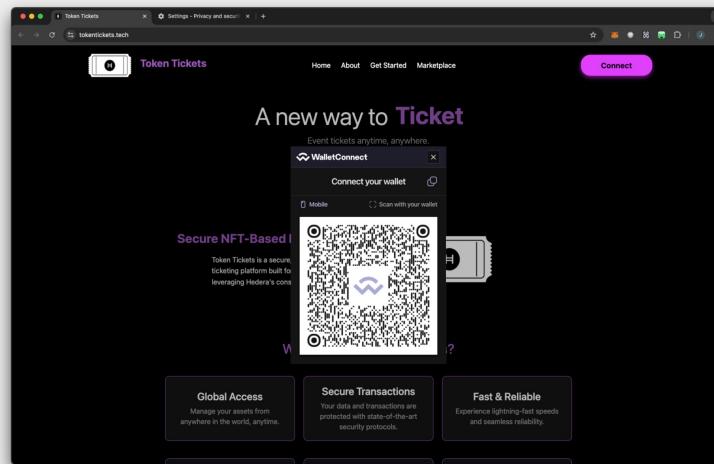




Token Tickets

Features

Walletconnect offers seamless integration of hashpack, the leading HBAR wallet, best used as a chrome extension.



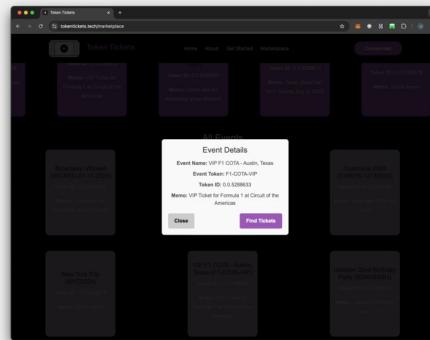


Token Tickets

Features

The Token Marketplace offers users the ability to see a revolving list of featured tickets, as well as all tickets posted on the dApp.

Each event card provides the users information and the ability to purchase



The screenshot displays the Token Tickets Marketplace website. At the top, there's a navigation bar with links for Home, About, Get Started, Marketplace (which is highlighted), and a Connected button. The main section is titled "Token Marketplace" with the sub-instruction "Browse events and manage your tickets seamlessly." A "Event Organizer?" button is visible. The page features several event cards:

- Jackson 22nd Birthday Party (BDAYBASH)**
Token ID: 0.0.5288628
Memo: Jackson's birthday bash
- VIP F1 COTA - Austin, Texas (F1-COTA-VIP)**
Token ID: 0.0.5288633
Memo: VIP Ticket for Formula 1 at Circuit of the Americas
- The Beatles: Magic Mystery Tour (MAGIC-MYSTERY-LNDN-1967)**
Token ID: 0.0.5288597
Memo: Come see the Broadway show Wicked!
- Texas State Fair (TXSTFAIR)**
Token ID: 0.0.5288615
Memo: Texas State Fair NFT Tickets, Day 5, 2025

Below these, there are sections for "All Events" and "My Tickets". The "All Events" section includes cards for "Broadway: Wicked (WICKED-01-17-2025)" and "Coachella 2024 (OWBYS-12182024)".

Event Organizers: click on the “Event Organizer?” button for the Organizer View



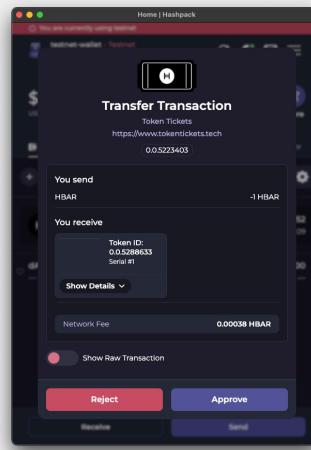
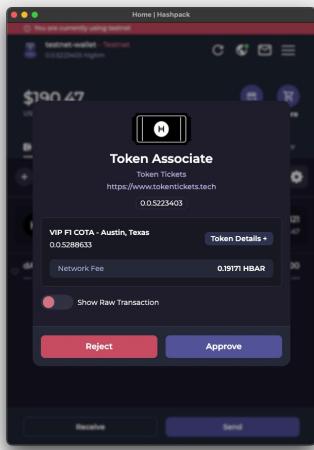


Token Tickets

Features

The Buy page offers users the ability to select specific tickets (NFT serials) and buy.

Upon purchase, users will be prompted to associate the token with their account and then to approve the HBAR-for-NFT transaction.



The screenshot shows the Token Tickets website's "Buy Tickets" page. At the top, there's a navigation bar with "Connected" status. Below it, a "Buy Tickets" button is prominently displayed. Under "Event Details", the token information is listed: Token Name: VIP F1 COTA - Austin, Texas; Token Symbol: F1-COTA-VIP; Token ID: 0.0.5288633; Memo: VIP Ticket for Formula 1 at Circuit of the Americas; Max Supply: 10; Organizer: 0.0.5288632. The "Available Tickets" section lists five serial numbers with their respective prices and "Buy" buttons:

Serial #	Price: 1 HBAR	Buy
Serial #1	1 HBAR	Buy
Serial #2	2 HBAR	Buy
Serial #3	3 HBAR	Buy
Serial #4	4 HBAR	Buy
Serial #5	5 HBAR	Buy





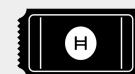
Token Tickets

Features

The Event Organizer page offers these Event Management Tools:

- ❖ Create Events
- ❖ Mint Event Tickets
- ❖ View/Manage Events

The screenshot shows a dark-themed web application window titled "Token Tickets". At the top right, there is a purple button labeled "Connected". The main header reads "Event Organizers" with a subtitle "Create, mint, and manage event tokens with ease." Below the header are three call-to-action buttons: "Create Event Tokens" (with a sub-subtitle "Create a unique NFT ticket collection for your upcoming event"), "Mint Event Tickets" (with a sub-subtitle "Mint additional tickets for your existing events"), and "View Events" (with a sub-subtitle "Explore and manage the events in your account").





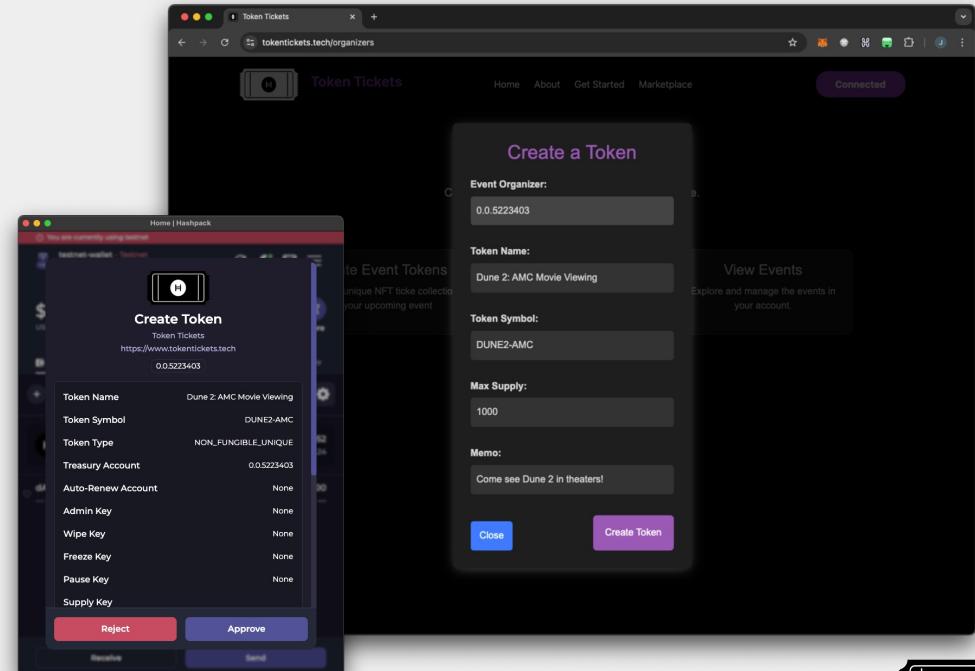
Token Tickets

Features

Organizers can create event tokens.

The dApp assists in token creation, dissolving the learning curve and the technical knowledge required to access the Hedera network.

The secure third party wallet transaction assures transparency in their transaction, as well as associated transaction fees.





Token Tickets

Features

Organizers mint event tickets

The dApp makes ticket minting seamless!

Organizers can enter ipfs:// formatted metadata to be minted, as well as a price in HBAR.

After minting, users issue allowance to Token Tickets to sell tickets on their behalf.

Mint Event Tickets

#	Metadata	Price (HBAR)	Action
1	ipfs://my-metadata-ticket-1.json	50	Remove
2	ipfs://my-metadata-ticket-1.json	40	Remove

Allowance Approve

Approve Transaction
https://www.tokentickets.tech
0.0323403

NFT Allowances:

Token ID	Fee (HBAR)
0.05288691	0.0001 HBAR

Please ensure allowance amounts are reasonably and expected.

Show Raw Transaction

Reject Approve

Token Mint

Token to mint to
Dune 2: AMC Movie Viewing - 0.05288691

NFT Preview

Token ID:	Token ID:
0.05288691	0.05288691

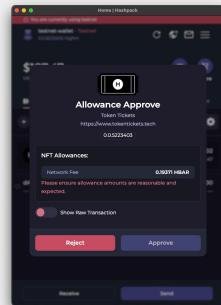
Show Details Show Details

Approx. fee: 0.0371 HBAR

Network Fee: 0.01497 HBAR

Show Raw Transaction

Reject Approve





Token Tickets

Features

Organizers mint event tickets

The dApp makes ticket minting seamless!

Users can enter ipfs:// formatted metadata to be minted, as well as a price in HBAR.

After minting, users issue allowance to Token Tickets to sell tickets on their behalf.

Mint Event Tickets

#	Metadata	Price (HBAR)	Action
1	ipfs://my-metadata-ticket-1.json	50	Remove
2	ipfs://my-metadata-ticket-2.json	40	Remove

Allowance Approve

NFT Preview

Token ID:	Token ID:
0.0.5288691	0.0.5288691

Max Transaction Fee (Hbar): 10

Close Mint Tokens

Token to mint to: Dune 2: AMC Movie Viewing - 0.0.5288691

NFT Preview

Token ID: 0.0.5288691

Token ID: 0.0.5288691

Show Details Show Details

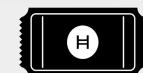
Approx. fee: 0.0371 HBAR

Network Fee: 0.01497 HBAR

Show Raw Transaction

Reject Approve

Receive Send





Token Tickets

Features

Organizers can view their events locally and on hashscan

The screenshot shows the Token Tickets organizer dashboard with a dark theme. At the top, there's a navigation bar with links for Home, About, Get Started, Marketplace, and a Connected button. Below the navigation is a section titled "Event Organizers" with the sub-instruction "Create, mint, and manage event tokens with ease." There are three main buttons: "Create Event Tokens" (with the sub-instruction "Create a unique NFT ticket collection for your upcoming event"), "Mint Event Tickets" (with the sub-instruction "Mint additional tickets for your existing events"), and "View Events" (with the sub-instruction "Explore and manage the events in your account"). A large callout box highlights the "Your Events" section, which displays a card for the "Dune 2: AMC Movie Viewing" event. The card includes the Token ID (0.0.5288691), Memo ("Come see Dune 2 in theaters!"), Supply Key (a long string of hex and alphanumeric characters), and Max Supply (1000). A purple "View on Hashscan" button is at the bottom of this card.

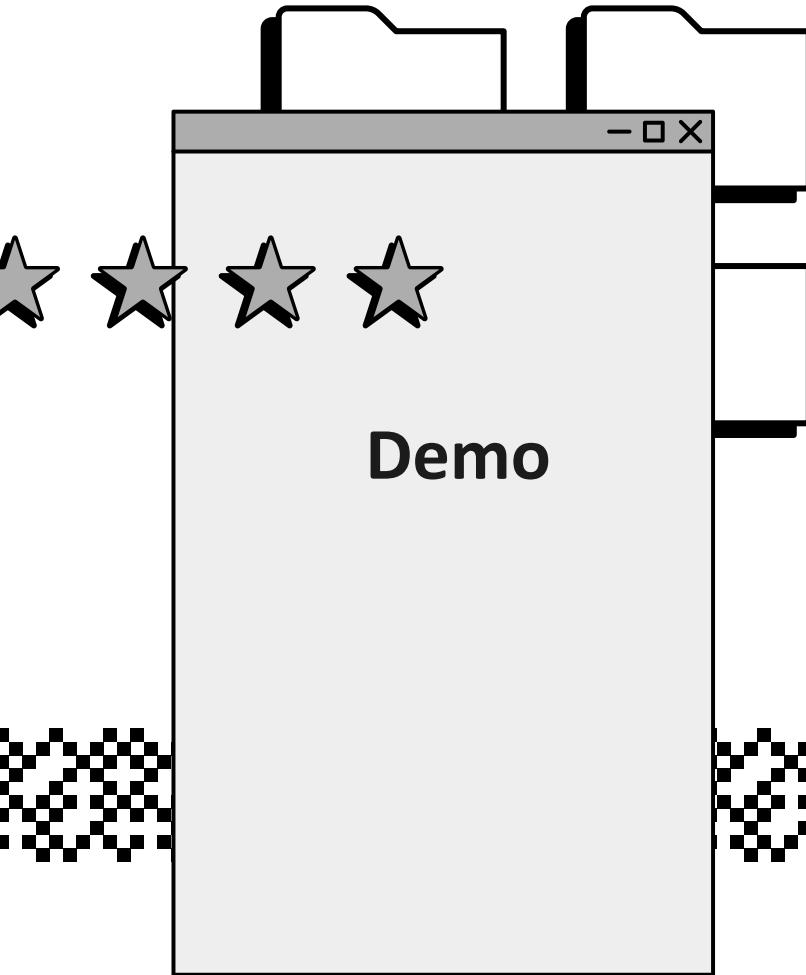
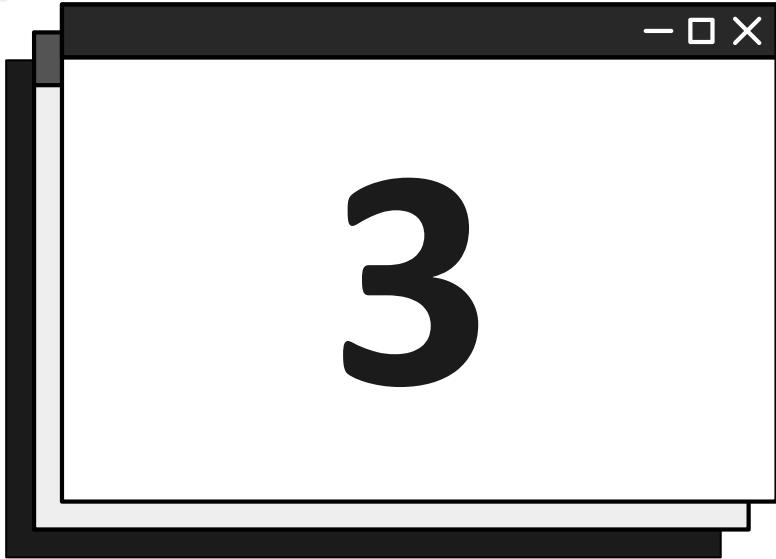
The screenshot shows the HashScan interface for the "Dune 2: AMC Movie Viewing" NFT collection. The top navigation bar includes links for Dashboard, Transactions, Tokens, Topics, Contracts, Accounts, Nodes, Staking, and Blocks, along with a "TESTNET" dropdown and a "CONNECT WALLET..." button. The main content area is titled "NFT Collection" and shows the following details:

Name	Dune 2: AMC Movie Viewing	Treasury Account	0.0.5223403
Symbol	DUNE2-AMC	Created at	8:36:01 AMPT Dec 18, 2024, CST
Memo	Come see Dune 2 in theaters!	Modified at	8:36:01 AMPT Dec 18, 2024, CST
Metadata	None	Total Supply	4
Create Transaction	0.0.5223403@173457547.146514732	Initial Supply	0
Expires at	9:35:59:000 PM Mar 18, 2025, CDT	Max Supply	1,000
Auto Renew Period	90 days	Decimals	0
Auto Renew Account	None	Pause Status	Not applicable
Freeze Default	false		

Below this, a table titled "NFTs" lists three entries:

Preview	#	Name	Creator	Owner	Description
NFT	1		0.0.5223403		
NFT	2		0.0.5223403		
NFT	3		0.0.5223403		

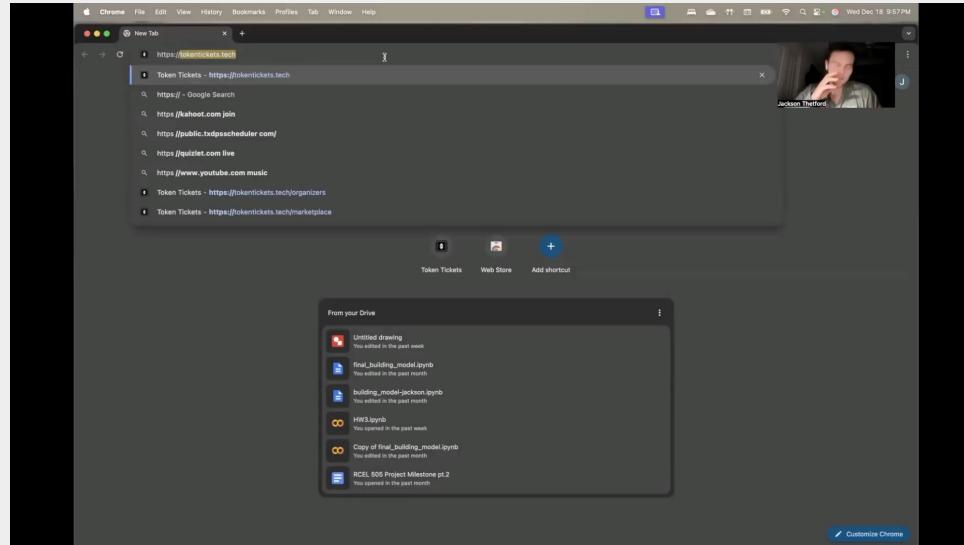






Token Tickets

Demo



YouTube Link: <https://youtu.be/bOguLpTIPfA>
Website Link: <https://www.tokentickets.tech>

* Chrome web browser with the hashpack extention is strongly recommended





Development



Token Tickets

Development

All account and token transactions occur on Hedera's network, with the Token Tickets local database only storing information to help declutter the technical knowledge of NFT management:

Users can be confident no personal data is at risk.

All transactions requiring user private keys are securely managed with Hashpack wallet.

All data is processed through encrypted HTTPS Secure Sockets Layer protocol through walletconnects WebSocket Handshake.

```
const EventSchema = new mongoose.Schema({  
  tokenId: { type: String, required: true },  
  supplyKey: { type: String, required: true },  
  tokenName: { type: String, required: true },  
  tokenSymbol: { type: String, required: true },  
  tokenMemo: { type: String },  
  maxSupply: { type: Number, required: true },  
  transactionStatus: { type: String, required: true },  
  createdAt: { type: Date, default: Date.now },  
  serialNumbers: { type: [Number], default: [] },  
  organizerAccountId: { type: String, required: true },  
});
```

```
const TicketSchema = new mongoose.Schema({  
  tokenId: { type: String, required: true },  
  tokenName: { type: String, required: true },  
  tokenSymbol: { type: String, required: true },  
  serialNumber: { type: Number, required: true },  
  price: { type: Number, required: true },  
  ownerAccount: { type: String, required: true },  
  createdAt: { type: Date, default: Date.now },  
});
```





Token Tickets

Development

Dev Structure followed that of a typical dynamic React.js project.

assets:/ Media and fonts

components:/ Reusable UI components (buttons, cards, forms, etc.)

pages:/ React components for individual views in the app (Home, Marketplace)

services:/ Contains service files for backend and Hedera network API calls. Api is the backend routes, local is with hedera, wallet is the logic between Token Tickets and walletconnect.

store:/ Manages the global state of the application, with Redux

styles:/ CSS files for UI look

tests:/ Unit tests for code

App.jsx: The entry point for the React application and routing

index.js: Renders the app to the DOM.

.env: Config file for API keys Token Tickets testnet account info, ENV, etc.

```
src/
  assets/
  components/
  pages/
  services/
    api/
    local/
      wallet/
  store/
  styles/
  tests/
  App.jsx
  index.js
  .env
  .gitignore
  LICENSE
  package-lock.json
  package.json
  README.md
```





Token Tickets

Development

Dev Structure followed that of a typical dynamic React.js project.

config/: Database config, database connection logic.

dev/: Route testing and data injection

middleware/: Middleware. API key verification.

models/: Typically stores the database models for your application (Schemas)

routes/: Contains route definitions for the API endpoints.

.env: Stores environment variables such as database credentials or API keys.

server.js: The main entry point for the backend server, where the Express.js server is initialized and routes are implemented. Enforces middleware

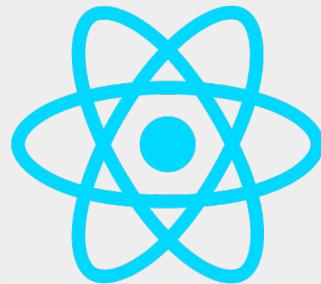
```
backend/
├── config/
├── dev/
├── middleware/
├── models/
├── node_modules/
├── routes/
├── .env
└── package-lock.json
    └── package.json
        └── server.js
```





Token Tickets

Development Tools



DigitalOcean



PM2



5



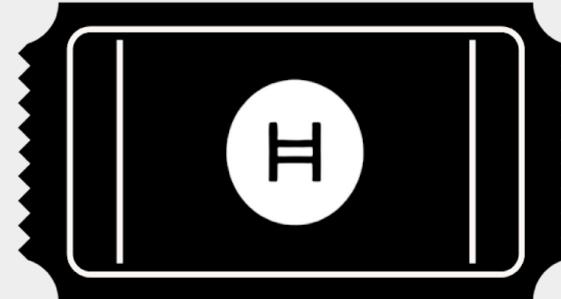
Future Work



Token Tickets

Future Work

- **Mass-minting ability**
- **User-to-User ticket transfers**
- Mobile App development
- Cross-chain integration
- Scalability (especially for NFT minting) and load testing
- User analytics and better user dashboard
- Smart contract functionality
- Ticket recommendation algorithm





Thank You!