NODEWAVES

A Tap-to-Earn Gaming Protocol

Where Players Tap, Pools Win, and Developers Earn

Version	Date	Status	Network
1.0	November 2025	Active Development	Base (Ethereum L2)

ABSTRACT

Nodewaves is a decentralized tap-to-earn gaming protocol that combines play-to-earn mechanics with virtual cryptocurrency mining pools. The protocol creates a three-sided marketplace where players generate virtual hashes through gaming, investors stake tokens to upgrade pool infrastructure, and game developers earn rewards proportional to player engagement. Every two minutes, mining pools compete for block rewards distributed as: 40% to players, 40% to investors, 14% to game developers, and 6% to the protocol treasury. Built on Base (Ethereum L2) and integrated with Farcaster, Nodewaves provides a sustainable alternative to traditional play-to-earn games and physical cryptocurrency mining.

1. INTRODUCTION

1.1 The Problem

The gaming and Web3 industries face fundamental misalignments:

Traditional Play-to-Earn Games:

- Exhibit Ponzi-like economics where new player money funds early investors
- Lack sustainable reward structures beyond token speculation
- Create no lasting value for the ecosystem
- Feature high barriers to entry (required capital, technical knowledge)
- Lock players into single-game ecosystems

Traditional Cryptocurrency Mining:

- Requires expensive specialized hardware ($1,000-$10,000+ per miner)
- Demands high electricity costs (environmental and financial)
- Necessitates technical expertise to operate profitably
- Concentrates in few large pools due to economies of scale
- Provides no entertainment or engagement value

The Gap:

No protocol successfully combines:

- Sustainable economics (not speculative)
- Engaging entertainment (not just earning mechanics)
- Low barrier to entry (accessible globally)
- Fair value distribution (among players, developers, and infrastructure providers)
- Transparent and verifiable operations

1.2 The Opportunity

Southeast Asia represents a **$1.1B+ gaming market** with unique characteristics:

- **Mobile-first:** 95%+ of gaming is mobile
- **High engagement:** Longest gaming sessions globally
- **Underserved by Web3:** Most Web3 games target developed markets
- **Price-sensitive:** Lower income creates higher engagement/earning ratio
- **Community-driven:** Social aspect of gaming is paramount

Additionally, Farcaster's emergence as a social Web3 platform creates a unique distribution opportunity for mini-app games with native token integration.

2. NODEWAVES PROTOCOL OVERVIEW

2.1 Core Concept

Nodewaves is a tap-to-earn gaming ecosystem where:

- **Players** generate virtual hashes by tapping in integrated games
- **Investors** stake NWS tokens to create and upgrade mining pools
- **Developers** create engaging games and earn rewards for player engagement
- **Protocol** facilitates transparent, decentralized mining and reward distribution

Every 2 minutes, a new "block" is created. The mining pool with the most accumulated hashes wins the block reward, which is distributed proportionally to all participants (players, investors, and developers).

2.2 Key Innovation

Traditional mining uses computational power (hash rate). Nodewaves uses **gameplay engagement** as the source of hash generation. This creates:

Benefit	Description
Entertainment Value	Mining becomes fun (games)
Accessibility	No hardware required
Sustainability	Engagement metrics are harder to game than computational metrics
Environmental	Virtual mining instead of physical computation
Fairness	Anyone with a smartphone can participate

2.3 The Three-Sided Marketplace

Players (40% of Block Rewards)

- Join mining pools of their choice
- Play integrated games for 2-minute cycles
- Earn NWS tokens proportional to their taps
- Can progress to investor status by staking earnings

Value Proposition: Entertainment + income opportunity with no upfront capital

Investors (40% of Block Rewards)

- Create and manage virtual mining pools
- Stake NWS tokens for pool upgrades
- Earn passive income from block rewards
- Build competitive advantages through strategic upgrades

Value Proposition: Passive income, portfolio diversification, DeFi participation

Game Developers (14% of Block Rewards)

- Develop engaging Farcaster mini-app games
- Integrate single-line SDK
- Earn rewards proportional to taps generated
- Retain full creative control

Value Proposition: Fair revenue sharing, player metrics, sustainable business model

Protocol Treasury (6% of Block Rewards)

- Funds smart contract audits and upgrades
- Supports developer grants and incentives
- Finances marketing and user acquisition
- Builds institutional infrastructure

Value Proposition: Self-sustaining ecosystem growth mechanism

3. PROTOCOL MECHANICS

3.1 The Mining Cycle (2 Minutes)

```
MINUTE 0:00 → START OF CYCLE ├─ All players begin tapping in various games ├─ Taps accumulate in their assigned pool ├─ Hash calculation: Taps × H/T × (1 - Degradation) └─ Power consumption tracked in real-time MINUTE 1:59 → END OF CYCLE ├─ All pools finalize hash counts ├─ Pool with highest hash count wins ├─ Block reward is created (variable NWS amount) ├─ Rewards distributed: │ ├─ 40% → Players (proportional to taps) │ ├─ 40% → Investors (proportional to stake) │ ├─ 14% → Developers (proportional to taps in their game) │ └─ 6% → Protocol treasury └─ New cycle begins immediately
```

3.2 Hash Generation Formula

```
Virtual Hashes = Taps × Hashes_per_Tap × (1 - Degradation_Rate)
```

Variables:

- **Taps:** Individual player actions (constrained by game design)
- **Hashes_per_Tap:** ASIC R&D level (starting at 13 H/T, upgradeable)
- **Degradation_Rate:** Equipment wear (0-100% based on megataps processed)

Example:

```
Player A: 100 taps × 13 H/T × (1 - 0.05 degradation) = 1,235 hashes Player B: 150 taps × 14 H/T × (1 - 0.02 degradation) = 2,082 hashes
```

3.3 Pool Upgrades

Investors upgrade their pools through three mechanisms:

1. ASIC R&D (Efficiency)

- Increases hashes per tap (13 H/T → 14 H/T → 15 H/T)
- Community-funded by staking NWS
- Unlocks new miner generations (GEN5 → GEN6 → GEN7)

2. ASIC Units (Equipment)

- Virtual ASIC miners available in GEN1-GEN5+ generations
- Purchased with NWS tokens
- Standard delivery: 5 weeks
- Rush delivery: 2 weeks (premium cost)
- Degrade based on usage (require replacement)

3. Licensing (Capacity)

- Increase unit capacity (e.g., 4,000 → 7,500 units)

- Increase power quota (e.g., 100 MW → 125 MW per cycle)
- Acts as regulatory constraint preventing centralization

3.4 Power Quota System

```
Power_Consumption = Total_Taps × Power_per_Kilotaps
```

Constraints:

- Exceeding quota causes gameplay pause
- Penalty deducted from future block rewards
- Incentivizes strategic pool management

Purpose:

- Mirrors real-world resource constraints
- Prevents unbounded pool growth
- Creates recurring upgrade demand
- Balances network participation

4. TOKENOMICS

4.1 NWS Token Utility

1. **Staking:** Stake to upgrade pool infrastructure
2. **Trading:** Tradeable on DEXs for price discovery
3. **Governance:** Future governance participation (implied)
4. **Rewards:** Distribution medium for block rewards

4.2 Block Reward Distribution

Per Block Reward Split:

- Players: 40%
- Investors: 40%
- Game Developers: 14%
- Protocol Treasury: 6%

Distribution Within Groups:

- **Players:** Proportional to individual taps contributed
- **Investors:** Proportional to NWS staked in winning pool
- **Developers:** Proportional to taps from their specific game(s)

4.3 Sustainability Mechanisms

1. Degradation

ASIC miners degrade with usage, creating ongoing demand for replacement NFTs and preventing infinite wealth accumulation.

2. Exponential Upgrade Costs

Each upgrade tier costs progressively more, preventing single pool monopoly and encouraging distributed ecosystem.

3. Power Quota Limits

Natural ceiling on pool size diversifies network across multiple pools and prevents centralization.

4. Multi-Stream Revenue

Protocol doesn't depend on single revenue source. Treasury self-funds without extracting from players.

4.4 Economic Incentives Alignment

Stakeholder	Incentive	Outcome
Players	Tap more → earn more	Engagement increases

Investors	Upgrade pool → win more blocks	Infrastructure improves
Developers	Create better games → more taps → more rewards	Game quality increases
Protocol	Treasury grows → can fund ecosystem	Ecosystem sustainability

5. NFT MINER ASSETS

5.1 ASIC Miner NFTs

What: Each NFT represents one virtual ASIC miner with unique characteristics

Characteristics:

- Unique ID and stat profile
- Hash power (H/T): 10-20 range
- Power consumption (W/KT): varies by generation
- Generation level (GEN1-GEN5+)
- Current degradation rate
- Megataps processed (lifetime usage)

Properties:

- **Ownership:** Full non-custodial control
- **Transferability:** Resellable on internal marketplace (5-8% fee)
- **Staking:** Can be staked in any pool
- **Degradation:** Decreases with usage, requires replacement

5.2 Limited Release Schedule

Purpose: Create scarcity and sustainable demand

- **Weekly Release:** Limited quantity per game ecosystem
- **Supply Control:** Prevents market flooding
- **Secondary Market:** Price discovery through resales
- **Premium Versions:** Rare high-stat variants available at premium

6. REVENUE STREAMS & MONETIZATION

6.1 Current Revenue Streams

1. NFT Miner Sales (Primary)

- Sold for USDC
- Limited weekly distribution
- Protocol captures 100% of primary sales
- Margin: 85-90%+

2. Secondary Marketplace Fees (5-8%)

- Protocol collects on each resale
- Peer-to-peer trading
- Rewards active traders with lower slippage

3. Mini Game Sales (40-60% to developers)

- Premium games sold for USDC
- Revenue split with developers
- Incentivizes high-quality game creation

4. Block Reward Treasury (6%)

- Automatic allocation from every block
- Funds operations, audits, marketing
- Self-sustaining mechanism

5. Marketplace Transaction Fees

- Token swaps: 0.5-1%
- Game sales: 2-3%
- Pool upgrades: 2-3%

6.2 Planned Revenue Diversification

6. Cosmetic NFTs

Player avatars, pool skins, equipment appearances. Zero gameplay impact, high margin (85-90%), monthly collections.

7. Seasonal Battle Pass

$4.99-9.99/month USDC with exclusive cosmetics, tap multipliers, early access. Recurring subscription revenue.

8. Sponsorships & Partnerships

Gaming network brand placements, sponsored cosmetics, tournament sponsorships.

9. Institutional Pool Tiers

Whitelisted high-value pools ($10K-$1M+ minimum) with 0.5-2% annual management fee on AUM.

10. Technology Licensing (B2B)

White-label SDK for other gaming protocols. $10K-50K per licensee per year.

7. TECHNICAL ARCHITECTURE

7.1 Current Implementation

- **Platform:** Farcaster Mini-Apps
- **Blockchain:** Base (Ethereum L2)
- **Rationale:** Fast transactions (< 1 sec), low costs (<$0.01), Ethereum security

7.2 Smart Contracts

1. Pool Management Contract

- Manages pool state, upgrades, member lists
- Tracks TVL and stake distribution
- Executes upgrades and transitions

2. Mining Logic Engine

- Calculates hashes from tap data
- Determines block winners
- Manages power quota tracking

3. Staking Contract

- Handles NWS token locking
- Tracks upgrade tiers
- Manages time-based vesting

4. Reward Distributor

- Processes 2-minute block rewards
- Splits 40-40-14-6 distribution
- Handles failed transaction retries

7.3 Transparency & Verification

Mechanism: Nostr Protocol

- Tap batches sent via Nostr relays
- Multiple independent relays store tap data
- Community can verify tap counts independently
- No single point of truth (decentralized verification)

7.4 User Integration Points

Wallet Integration:

- Farcaster embedded wallet (non-custodial)

- Users control all assets
- Seamless USDC and NWS management

DEX Integration:

- In-app ETH ↔ NWS swaps
- No need to leave Farcaster app
- Low slippage via Base DEX aggregators

8. COMPETITIVE ADVANTAGES

8.1 vs. Traditional Play-to-Earn

Aspect	Traditional P2E	Nodewaves
Tokenomics	Ponzi-like	Sustainable, multi-stream
Marketplace	Single game	Game-agnostic platform
Verification	Centralized	Transparent (Nostr)
Entry Barrier	Moderate	Very low (free)

8.2 vs. Physical Cryptocurrency Mining

Aspect	Physical Mining	Nodewaves
Entry Cost	$1,000-$50,000	Free to play
Electricity	High (expensive)	Virtual (zero)
Technical	Complex	Mobile friendly
Entertainment	None	Gameplay fun

8.3 Unique Differentiators

1. First Tap-to-Mine Protocol

No direct competitors. Occupies novel category with first-mover advantage.

2. Three-Sided Marketplace

Players, Investors, Developers all incentive-aligned. Network effects multiply with each participant type.

3. Transparent Verification

Nostr protocol ensures independence. Community can audit any claims.

4. Game-Agnostic Platform

Multiple games = multiple engagement funnels. Developers integrate easily (1 line of code).

5. Mobile-First on Farcaster

Native social integration. Frictionless sharing and virality. Embedded wallet for seamless UX.

6. Southeast Asia Focus

Addresses massive underserved market. Better unit economics. Cultural fit with gaming preferences.

9. RISK MITIGATION

9.1 Technical Risks

Bot Farming (Automated Tapping)

Mitigation: Farcaster account requirements, rate limiting per account, game design that prevents bot-friendly mechanics

Residual Risk: Low (social verification plus game mechanics alignment)

Smart Contract Vulnerabilities

Mitigation: Professional security audits, staged rollout, bug bounty program

Residual Risk: Medium (inherent to all blockchain systems)

9.2 Economic Risks

Token Price Volatility

Mitigation: Sustainable tokenomics, multiple utility sources, community governance

Residual Risk: Medium (market-dependent)

Pool Centralization

Mitigation: Exponential upgrade costs, power quota limits, transparent pool metrics

Residual Risk: Low (network design prevents monopoly)

NFT Sales Plateau

Mitigation: Multiple revenue streams reduce dependency, cosmetics and battle pass launch

Residual Risk: Low (diversified revenue)

9.3 Engagement Risks

Game Quality Issues

Mitigation: Revenue model naturally rewards engaging games, developer grants, community feedback

Residual Risk: Medium (dependent on game ecosystem)

Player Churn

Mitigation: Battle pass retention mechanics, cosmetics, social features, developer incentives

Residual Risk: Medium (typical for gaming products)

10. USE CASES & PERSONAS

10.1 Imran - The Investor

Profile

31-year-old entrepreneur, crypto investor from Mumbai, India

Initial Investment: $200 (ETH → NWS tokens)

Outcome: Pool grows to $50K TVL, generates $500+/month passive income

10.2 Alex - The Developer

Profile

22-year-old game designer from California, USA

Game: "Hit It!" (rhythm/music tapping game)

Outcome: 10K+ daily players, earns $5K-10K/month

10.3 Ahmad - The Player

Profile

22-year-old from Dhaka, Bangladesh. Works in family shop.

Motivation: Save $500 for motorbike (6-month goal)

Outcome: Reaches savings goal early, gains ongoing passive income

11. FUTURE ROADMAP

11.1 Custom L1 Blockchain (Under Discussion)

Status: Strategic option, post-launch consideration

Motivation:

- Full control over tokenomics and monetary policy
- Customized consensus optimized for gaming
- Lower transaction costs at scale
- Enhanced security specific to gaming requirements
- Independence from Ethereum ecosystem

Timeline:

1. Validate product-market fit on Base L2 (Q1-Q2 2026)
2. Gather community feedback on tokenomics (Q2 2026)
3. Design custom L1 architecture (Q3 2026)
4. Develop and audit custom L1 (Q4 2026 - Q1 2027)
5. Gradual migration from Base to custom L1 with bridge (Q2 2027+)

12. CONCLUSION

12.1 The Vision

Nodewaves creates a sustainable gaming-finance ecosystem where:

- **Players** enjoy games AND earn income
- **Investors** generate passive returns from game engagement
- **Developers** build profitable gaming businesses
- **Protocol** self-funds through multi-stream economics

12.2 Why It Matters

1. **Sustainable:** Not dependent on token speculation or new money flowing in
2. **Accessible:** Anyone with a smartphone can participate globally
3. **Fair:** All stakeholders aligned with protocol success
4. **Transparent:** Verifiable through Nostr protocol
5. **Entertainment-First:** Fun games, not just earning mechanics

12.3 Why Now

- **Farcaster Growth:** Mini-apps ecosystem maturing
- **Southeast Asia Opportunity:** $1.1B market, underserved by Web3
- **DeFi Maturity:** Base L2 proven infrastructure ready
- **Market Demand:** Fatigue with pure speculation, appetite for value creation

12.4 The Call to Action

Nodewaves invites:

- **Game Developers:** Build on our platform (14% of block rewards)
- **Investors:** Create pools and earn passive income (40% of block rewards)
- **Players:** Play, earn, and progress to investor (40% of block rewards)
- **Partners:** License our technology (B2B opportunities)

Together, let's tap into the future of gaming and DeFi.

APPENDIX A: TERMINOLOGY

Term	Definition
Hash	Virtual cryptographic unit generated from taps
Tap	Single player action in a game (button press, screen touch)
H/T	Hashes per Tap (efficiency metric)
Block	2-minute cycle resulting in reward distribution
Mining Pool	Group of players/investors competing together
ASIC	Virtual mining equipment (as NFT)
Degradation	Equipment wear/efficiency loss from usage
TVL	Total Value Locked (total NWS staked)
Megataps	1 million taps (unit of lifetime usage)
GEN (Generation)	Tier level of miners (GEN1-GEN5+)

APPENDIX B: KEY STATISTICS

- **Block Frequency:** Every 2 minutes
- **Reward Split:** 40% players / 40% investors / 14% developers / 6% protocol
- **Secondary NFT Sales Fee:** 5-8%
- **Token Swap Fee:** 0.5-1%
- **Game Sales Fee:** 2-3%
- **Pool Upgrades Fee:** 2-3%
- **Battle Pass Price:** $4.99-9.99/month USDC
- **Institutional Management Fee:** 0.5-2% annual on AUM
- **Developer Integration:** Single-line SDK implementation

DISCLAIMER

> This yellow paper is for informational purposes only and does not constitute investment advice, a security offering, or a commitment to develop products as described. All statements are subject to change. Readers should conduct their own due diligence before participating in the protocol.

Nodewaves Protocol

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