

Technical Design Document 02: Ethical Systems & Retention

Version: 1.0.0

Source Material: Consolidated from "Ethical Game Design Patterns" and "Strategy Game Loop Analysis".

1. Philosophy: Accumulation vs. Depletion

We reject "Depletion Models" (e.g., base decay, starvation mechanics) that punish players for offline time. We adopt "Accumulation Models" where offline time generates potential value.

2. Retention Mechanic: The "Rested" System

This system unifies the concepts of "Rested XP" (Doc 2) and "Chronos Points" (Doc 4).

2.1 The Math of Time Banking

- **Accumulation Rate:** Players earn 1 "Time Unit" (TU) for every minute offline.
- **Cap:** The pool caps at 72 hours (3 days). This specifically targets the "Weekend Warrior" demographic, allowing them to play efficiently without daily login pressure.

2.2 Implementation (Shared Schema)

```
// shared/schemas/PlayerRetention.ts
import { Schema, type } from "@colyseus/schema";

export class PlayerRetention extends Schema {
  @type("number") lastLogoutTime: number;
  @type("number") restedPool: number; // 0.0 to 100.0 (Percentage of Cap)

  // Configuration
  private static MAX_POOL_HOURS = 72;
  private static GAIN_PER_HOUR = 100 / PlayerRetention.MAX_POOL_HOURS;

  /**
   * Called on Server Join.
   * Calculates offline drift and awards Rested Potential.
   */
  calculateOfflineGain() {
    const now = Date.now();
    const hoursOffline = (now - this.lastLogoutTime) / (1000 * 60 * 60);
```

```

    if (hoursOffline > 0.25) { // Minimum 15 min break required
        const gain = hoursOffline * PlayerRetention.GAIN_PER_HOUR;
        this.restedPool = Math.min(100, this.restedPool + gain);
    }

    this.lastLogoutTime = now;
}
}

```

3. Ethical RNG: The Shuffle Bag

To ensure fairness and transparency, we reject pure `Math.random()` for critical gameplay outcomes (combat hits, loot drops). We implement a "Shuffle Bag" (Tetris-style RNG).

3.1 Algorithm

1. **Input:** A probability (e.g., 25% Critical Hit).
2. **Bag Construction:** Create a bag of size N (e.g., 4). Fill with 1 "Success" and 3 "Failures".
3. **Shuffle:** Randomize order.
4. **Draw:** Draw without replacement until empty, then refill.

3.2 Benefits

- **Guaranteed Rates:** 25% is *exactly* 25% over 4 attempts.
- **Streak Mitigation:** Prevents "bad beat" streaks that cause churn.

4. Anti-Pattern Constraints

- **No Daily Streaks:** Login bonuses are based on total playtime or random intervals, never consecutive days.
- **No Pay-to-Skip:** Players cannot buy "Time Units" or speed-ups. Monetization is strictly cosmetic or analytic (e.g., stats dashboards).