

# Birds Party Deluxe Game - API Integration Guide for Unity Developers

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## Overview

This document provides comprehensive guidelines for integrating the Birds Party Deluxe game backend API with a Unity frontend. The game features a **dynamic grid progression system** (4x4 → 5x5 → 6x6), **connection-based clover mechanics**, **progressive booming reels multiplier system**, cluster-based connections, level advancement mechanics, cascading systems, and a Free Spin Bonus feature.

## API Endpoints

- Base URL: `https://b.api.ibibe.africa`
- Spin endpoint: `POST /spin/birdspartydeluxe`
- Stage-cleared processing: `POST /process-stage-cleared/birdspartydeluxe`
- Cascade endpoint: `POST /cascade/birdspartydeluxe`
- Health check: `GET /status`

## Game Mechanics

### Core Game Rules

- **Dynamic grid structure:** 4x4 → 5x5 → 6x6 based on level progression
- **Stage-cleared symbol priority removal:** Special symbols removed first before connections
- **Connection-based cluster system:** Horizontal/vertical adjacent symbols (birds + clovers)
- **Progressive booming reels:** X2 → X3 → X4 → X5 → X10 multiplier system
- 3-level progression system with automatic grid expansion
- Cascading mechanics with symbol removal and gravity
- Denomination: 0.01
- Bet amounts: 0.1, 0.2, 0.3, 0.5, 1.0 (corresponding to multipliers: 1, 2, 3, 5, 10)
- Minimum bet: 10 credits per bet multiplier

### Symbols

#### Regular Bird Symbols (Form Connections)

- Purple Owl, Green Owl, Yellow Owl, Blue Owl, Red Owl (23.75% each)
- **Connection-forming symbols** that create clusters and award payouts

#### Special Symbols (DELUXE: Two Separate Types)

- **Rainbow Egg (free\_game)** - Triggers 10 free spins (5% probability)
- **Four-leaf Clover (clover)** - Connection-based booming reels multiplier (5% probability)

#### Stage-Cleared Symbols (Priority Removal)

- **Level 1:** `orange_slice` - Orange slice symbol (5% probability on 4x4 grid)
- **Level 2:** `honey_pot` - Honey pot symbol (5% probability on 5x5 grid)
- **Level 3:** `strawberry` - Strawberry symbol (5% probability on 6x6 grid)

**IMPORTANT:** Stage-cleared symbols do NOT form connections. They are removed individually when they appear.

## DELUXE: Connection-Based Clover Mechanics

### How Clovers Work

1. **Clovers form connections** like regular bird symbols (minimum 4/5/6 depending on level)
2. **When clovers form valid connections**, they are removed from the grid
3. **Each clover connection upgrades** the booming reels multiplier:
  - 1st clover connection → X2 multiplier
  - 2nd clover connection → X3 multiplier
  - 3rd clover connection → X4 multiplier
  - 4th clover connection → X5 multiplier
  - 5th clover connection → X10 multiplier (maximum)
4. **Bird connections use current multiplier** for payout calculation
5. **Multiplier resets** when cascade sequence ends (no more connections)

### Multiplier Progression Example

```
Initial: 1x multiplier
Clover connection found → Upgrade to 2x
Bird connection pays: base_payout × 2x
Another clover connection → Upgrade to 3x
Bird connection pays: base_payout × 3x
No more connections → Reset to 1x for next spin
```

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## Dynamic Grid & Level System

- **Level 1:** 4x4 grid (16 positions), minimum 4 connected symbols required
- **Level 2:** 5x5 grid (25 positions), minimum 5 connected symbols required
- **Level 3:** 6x6 grid (36 positions), minimum 6 connected symbols required
- **Progression:** Accumulate 15 stage-cleared symbols to advance to next level
- **Cycling:** After Level 3, returns to Level 1 (infinite progression)
- **Grid Expansion:** Grid automatically resizes when advancing levels

## Free Spin System (DELUXE Differences)

### Free Spin Triggering

- **Rainbow Egg symbol** triggers 10 free spins
- **DELUXE:** Free spins do NOT re-trigger during free spins mode

- **Original:** Free spins could be re-triggered during bonus

## Free Spin Features

- **Booming reels continue** during free spins
- **Stage-cleared symbols continue** to appear and advance levels
- **Clover connections continue** to upgrade multiplier
- **No cost** for free spin rounds

## Stage-Cleared Symbol Mechanics

### Priority Removal System

1. **Stage-cleared symbols are detected** when grid is generated
2. **Priority removal:** Stage-cleared symbols are removed FIRST (ignore all connections)
3. **Gravity applied:** Symbols fall down, new symbols generated at top
4. **Then check connections:** Regular bird and clover symbol connections checked on new grid
5. **Count toward progress:** Each removed stage-cleared symbol counts toward 15

### Level-Specific Appearance

- **Only level-appropriate symbols appear:** Orange slice only on Level 1, etc.
- **Individual removal:** Each stage-cleared symbol is removed separately
- **No connection rules:** Stage-cleared symbols don't need to be connected
- **Progress tracking:** Each removed symbol = +1 toward level advancement

## Three-Endpoint Game Flow

### 1. Spin Phase - /spin/birdspartydeluxe

- Generates grid with potential connection-forming symbol connections (birds + clovers)
- **Identifies stage-cleared symbols** (does NOT remove them)
- **Processes clover connections first** → upgrades booming reels multiplier
- **Processes bird connections** → applies current multiplier to payouts
- **Checks for rainbow egg symbols** → triggers free spins if found
- **RNG validates bird connections only** (clovers always upgrade multiplier)
- **Sets cascading flag** if any connections exist
- Returns grid with stage-cleared symbol positions AND connection info

### 2. Stage-Cleared Processing - /process-stage-cleared/birdspartydeluxe

- **Removes all stage-cleared symbols** from grid
- **Applies gravity** and fills with new symbols
- **Updates stage progress** count and checks for level advancement
- **Processes new clover connections** → upgrades multiplier
- **Checks for NEW bird connections** → applies multiplier to payouts
- **RNG validates new bird connections** and sets cascading flag

- Returns updated grid with potential new connections

### 3. Cascade Phase - `/cascade/birdspartydeluxe`

- **Processes connection-forming symbols** from previous steps
- **Processes clover connections first** → upgrades multiplier
- **Processes bird connections** → applies current multiplier
- **ENHANCED:** Detects stage-cleared symbols that appear after gravity
- **Handles cascading mechanics** (remove → gravity → find new connections)
- **Resets multiplier** when no more connections exist (cascade sequence ends)
- **Returns stage-cleared detection info** for client to process via stage-cleared endpoint
- Continues until no more connections exist
- Handles RNG integration for subsequent bird connections

## API Interaction Flow

### 1. Basic Spin with DELUXE Mechanics

#### Initial Spin Request

```
POST /spin/birdspartydeluxe
{
  "client_id": "client_id_here",
  "game_id": "birdspartydeluxe",
  "player_id": "player_id_here",
  "bet_id": "bet_id_here",
  "gameState": {
    "bet": { "amount": 0.1, "multiplier": 1 },
    "currentLevel": 1,
    "gridSize": 4,
    "grid": [],
    "stageProgress": 5,
    "gameMode": "base",
    "freeSpins": {
      "remaining": 0,
      "totalAwarded": 0,
      "boomingReelsLevel": 0,
      "currentMultiplier": 1.0,
      "cloverConnectionsFound": 0
    },
    "totalWin": 0,
    "cascading": false,
    "lastConnections": [],
    "cascadeCount": 0,
    "stageClearedSymbols": []
  }
}
```

## Spin Response with DELUXE Features

```
{
  "status": "success",
  "message": "",
  "gameState": {
    "bet": { "amount": 0.1, "multiplier": 1 },
    "currentLevel": 1,
    "gridSize": 4,
    "grid": [
      ["orange_slice", "clover", "yellow_owl", "green_owl"],
      ["red_owl", "clover", "clover", "blue_owl"],
      ["blue_owl", "clover", "purple_owl", "red_owl"],
      ["purple_owl", "yellow_owl", "blue_owl", "green_owl"]
    ],
    "stageProgress": 5,
    "gameMode": "base",
    "freeSpins": {
      "remaining": 0,
      "totalAwarded": 0,
      "boomingReelsLevel": 1,
      "currentMultiplier": 2.0,
      "cloverConnectionsFound": 1
    },
    "totalWin": 0.08,
    "cascading": true,
    "lastConnections": [
      {
        "symbol": "clover",
        "positions": [
          {"x": 1, "y": 0}, {"x": 1, "y": 1}, {"x": 2, "y": 1}, {"x": 1,
"y": 2}
        ],
        "count": 4,
        "payout": 0.0
      },
      {
        "symbol": "yellow_owl",
        "positions": [
          {"x": 2, "y": 0}, {"x": 1, "y": 3}
        ],
        "count": 4,
        "payout": 0.08
      }
    ],
    "cascadeCount": 0,
    "stageClearedSymbols": [
      { "symbol": "orange_slice", "position": {"x": 0, "y": 0} }
    ]
  },
  "stageClearedSymbols": [
```

```

    { "symbol": "orange_slice", "position": {"x": 0, "y": 0} }
  ],
  "hasStageCleared": true,
  "totalCost": 0.1
}

```

## 2. Processing Stage-Cleared Symbols with Multiplier Continuity

### Stage-Cleared Processing Request

```

POST /process-stage-cleared/birdspartydeluxe
{
  "client_id": "client_id_here",
  "game_id": "birdspartydeluxe",
  "player_id": "player_id_here",
  "bet_id": "stage_cleared_001",
  "gameState": {
    "bet": { "amount": 0.1, "multiplier": 1 },
    "currentLevel": 1,
    "gridSize": 4,
    "grid": [
      ["orange_slice", "clover", "yellow_owl", "green_owl"],
      ["red_owl", "clover", "clover", "blue_owl"],
      ["blue_owl", "clover", "purple_owl", "red_owl"],
      ["purple_owl", "yellow_owl", "blue_owl", "green_owl"]
    ],
    "stageProgress": 5,
    "gameMode": "base",
    "freeSpins": {
      "remaining": 0,
      "totalAwarded": 0,
      "boomingReelsLevel": 1,
      "currentMultiplier": 2.0,
      "cloverConnectionsFound": 1
    },
    "totalWin": 0.08,
    "cascading": true,
    "lastConnections": [...],
    "cascadeCount": 0,
    "stageClearedSymbols": [
      { "symbol": "orange_slice", "position": {"x": 0, "y": 0} }
    ]
  }
}

```

### Stage-Cleared Processing Response

```

{
  "status": "success",
  "message": "",
  "gameState": {
    "bet": { "amount": 0.1, "multiplier": 1 },
    "currentLevel": 1,
    "gridSize": 4,
    "grid": [
      ["green_owl", "clover", "yellow_owl", "green_owl"],
      ["red_owl", "clover", "clover", "blue_owl"],
      ["blue_owl", "clover", "purple_owl", "red_owl"],
      ["purple_owl", "yellow_owl", "blue_owl", "green_owl"]
    ],
    "stageProgress": 6,
    "gameMode": "base",
    "freeSpins": {
      "remaining": 0,
      "totalAwarded": 0,
      "boomingReelsLevel": 1,
      "currentMultiplier": 2.0,
      "cloverConnectionsFound": 1
    },
    "totalWin": 0.08,
    "cascading": true,
    "lastConnections": [...],
    "cascadeCount": 1,
    "stageClearedSymbols": []
  },
  "stageClearedCount": 1,
  "levelAdvanced": false,
  "connections": [...],
  "totalCost": 0
}

```

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### 3. Enhanced Cascade Processing with Booming Reels

#### Cascade Request

```

POST /cascade/birdspartydeluxe
{
  "client_id": "client_id_here",
  "game_id": "birdspartydeluxe",
  "player_id": "player_id_here",
  "bet_id": "cascade_001",
  "gameState": {
    "bet": { "amount": 0.1, "multiplier": 1 },
    "currentLevel": 1,
    "gridSize": 4,
    "grid": [...],

```

```

    "stageProgress": 6,
    "gameMode": "base",
    "freeSpins": {
      "remaining": 0,
      "totalAwarded": 0,
      "boomingReelsLevel": 1,
      "currentMultiplier": 2.0,
      "cloverConnectionsFound": 1
    },
    "totalWin": 0.08,
    "cascading": true,
    "lastConnections": [...],
    "cascadeCount": 1,
    "stageClearedSymbols": []
  }
}

```

## Enhanced Cascade Response with Multiplier Reset

```

{
  "status": "success",
  "message": "",
  "gameState": {
    "bet": { "amount": 0.1, "multiplier": 1 },
    "currentLevel": 1,
    "gridSize": 4,
    "grid": [...],
    "stageProgress": 6,
    "gameMode": "base",
    "freeSpins": {
      "remaining": 0,
      "totalAwarded": 0,
      "boomingReelsLevel": 0,
      "currentMultiplier": 1.0,
      "cloverConnectionsFound": 0
    },
    "totalWin": 0.0,
    "cascading": false,
    "lastConnections": [],
    "cascadeCount": 2
  },
  "connections": [],
  "stageClearedSymbols": [],
  "hasStageCleared": false,
  "totalCost": 0
}

```

## Error Handling



## Stage-Cleared Processing Errors

```
{
  "status": "error",
  "message": "Invalid grid dimensions for level 2"
}
```

## Missing Stage-Cleared Symbols

```
{
  "status": "error",
  "message": "No stage-cleared symbols found to process"
}
```

## Common Errors

- "Invalid bet amount" - Bet amount not in allowed values (0.1, 0.2, 0.3, 0.5, 1.0)
- "client\_id is required" - Missing required field
- "Failed to retrieve game settings" - Settings service issue
- "Failed to determine outcome" - RNG service issue

## DELUXE vs Original Differences

### Key DELUXE Features

1. **Connection-Based Clovers:** Clovers must form connections to upgrade multiplier
2. **Progressive Booming Reels:** X2 → X3 → X4 → X5 → X10 multiplier progression
3. **Separate Special Symbols:** Rainbow egg (free spins) vs Clover (multiplier)
4. **No Free Spin Re-triggering:** Rainbow eggs don't trigger more free spins during free spins
5. **Multiplier Reset Logic:** Resets when cascade sequence ends
6. **Stage-Cleared During Free Spins:** Level progression continues during bonus

### Original vs DELUXE Comparison

Feature	Original Birds Party	Birds Party DELUXE
Free Spin Trigger	Free game symbol	Rainbow egg symbol
Multiplier System	Random 1.0-5.0x fixed	Progressive 2x-10x connection-based
Free Spin Re-trigger	Yes	No
Stage-Cleared in Free Spins	Forbidden	Allowed
Multiplier Progression	None	Clover connections upgrade
Special Symbol Count	1 (multi-purpose)	2 (separate functions)

# Testing and Debugging

## Debug Information

- Monitor server logs for clover connection detection and multiplier upgrades
- Track booming reels progression through cascade sequences
- Verify multiplier reset timing at cascade sequence end
- Check separation between rainbow eggs and clovers
- **NEW:** Monitor connection-based clover mechanics
- **NEW:** Track multiplier application to bird connections only

## Test Scenarios

1. **Connection-Based Clover Mechanics:** Verify clovers must form connections to upgrade
2. **Progressive Multiplier:** Test X2 → X3 → X4 → X5 → X10 progression
3. **Multiplier Reset:** Verify reset when cascade sequence ends
4. **Rainbow Egg vs Clover:** Test separate handling of special symbols
5. **No Free Spin Re-trigger:** Verify rainbow eggs don't re-trigger during free spins
6. **Bird Connection Multipliers:** Verify bird payouts use current multiplier
7. **Clover Connection Payouts:** Verify clovers don't pay, only upgrade multiplier
8. **Stage-Cleared During Free Spins:** Test level progression continues
9. **Level Advancement with Multiplier:** Test multiplier preservation during level up
10. **Complex Cascade Sequences:** Test multiple clover upgrades in one sequence

## Performance Considerations

- **Three-Endpoint Flow:** Ensure smooth transitions between endpoints
- **Grid Resizing:** Optimize UI transitions when changing grid sizes
- **Symbol Management:** Efficient loading/unloading of level-specific symbols
- **Animation Sequencing:** Coordinate stage-cleared removal with gravity effects
- **ENHANCED:** Multiplier Progression: Smooth visual feedback for booming reels upgrades
- **ENHANCED:** Connection Processing: Handle clover vs bird connection separation efficiently
- **ENHANCED:** Cascade Sequence Management: Track multiplier state throughout sequences

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## Debug Output Examples

### DELUXE Cascade Flow with Booming Reels

```
Starting DELUXE cascade sequence
Reset booming reels to 1.0x for new spin
Processing clover connections: 1 found
Booming reels upgraded to 2.0x
Processing bird connections: 2 found
Bird payouts calculated with 2.0x multiplier
Processing cascade #1
Found 1 clover connection
Booming reels upgraded to 3.0x
Found 2 bird connections
```

```
Bird payouts calculated with 3.0x multiplier
Processing cascade #2
Found 0 connections
Cascade sequence ended, resetting booming reels to 1.0x
DELUXE cascade sequence completed
```

### Level Advancement with Multiplier Preservation

```
Starting DELUXE cascade sequence
Booming reels at 3.0x from previous cascades
Stage-cleared processing: 4 symbols
Level advanced from 1 to 2, grid: 5x5
Found 1 clover connection on new level
Booming reels upgraded to 4.0x
Found 1 bird connection on new level
Bird payout calculated with 4.0x multiplier
DELUXE level advancement completed
```

## Key Enhancements in DELUXE Version

### 1. Connection-Based Clover System

- **Clover Connection Detection:** Clovers must form valid connections (4/5/6+ symbols)
- **Multiplier Upgrade Logic:** Each clover connection upgrades booming reels
- **Payout Separation:** Clovers upgrade multiplier, birds receive payouts
- **RNG Integration:** Only bird connections validated by RNG

### 2. Progressive Booming Reels

- **Sequential Upgrades:** 1x → 2x → 3x → 4x → 5x → 10x progression
- **Cascade Continuity:** Multiplier persists throughout cascade sequence
- **Reset Logic:** Resets when no more connections found
- **Visual Feedback:** Clear indication of current multiplier level

### 3. Enhanced Symbol Management

- **Dual Special Symbols:** Rainbow egg and clover with distinct functions
- **Connection-Forming Logic:** Birds and clovers can form connections
- **Stage-Cleared Priority:** Stage-cleared symbols processed first
- **Free Spin Mechanics:** No re-triggering during bonus rounds

### 4. Architectural Benefits

- **Maintainable Code:** Each endpoint has clear, distinct responsibilities
- **Flexible Integration:** Client can orchestrate complex flows as needed
- **RNG Integrity:** Proper RNG validation for bird connections only
- **Scalable Design:** Easy to add new features or modify individual components

# Advanced Flow Patterns

## Pattern 1: Simple Cascade without Multiplier

Spin (1x) → Cascade (bird connections only) → Cascade (more birds) → End

## Pattern 2: Clover Progression Flow

Spin (1x) → Clover connection (2x) → Cascade (birds at 2x) → Clover (3x) → Birds (3x) → End

## Pattern 3: Complex Mixed Flow with Level Up

Spin (1x) → Clover (2x) → Process-Stage-Cleared (level up) → Clover (3x) → Cascade (birds at 3x) → End

## Pattern 4: Maximum Multiplier Flow

Spin (1x) → Clover (2x) → Clover (3x) → Clover (4x) → Clover (5x) → Clover (10x) → Cascade (birds at 10x) → End

# Implementation Notes

## Backend Responsibilities

- Spin Handler:** Grid generation, clover/bird separation, multiplier management
- Process-Stage-Cleared Handler:** Stage-cleared removal, level advancement, multiplier preservation
- Cascade Handler:** Connection processing, multiplier progression, sequence management

## Client Responsibilities

- Flow Orchestration:** Coordinate between endpoints based on response flags
- Animation Management:** Handle visual transitions for multiplier changes
- State Management:** Maintain booming reels state throughout sequences
- User Experience:** Provide clear feedback for multiplier progression

## Critical Success Factors

- Connection Detection:** Ensure clovers form valid connections before upgrading
- Multiplier Tracking:** Maintain accurate multiplier throughout cascade sequences

3. **Symbol Separation:** Never mix clover upgrades with bird payouts
4. **Reset Timing:** Properly reset multiplier when cascade sequences end
5. **Visual Clarity:** Clear indication of booming reels progression for players

This DELUXE implementation provides a sophisticated, engaging slot game experience with progressive multiplier mechanics that reward players for finding clover connections while maintaining the core Birds Party gameplay that players love!