# **Sports Bar TV Controller - System Documentation**

Version: 2.3

Last Updated: October 16, 2025

Status: Production Ready

# **Quick Access Information**

# **Server Access**

Host: 24.123.87.42Port: 224 (SSH)

• Application Port: 3000 (HTTP)

• Username: ubuntu

Password: 6809233DjD\$\$\$ (THREE dollar signs)Application URL: http://24.123.87.42:3000

#### **SSH Connection:**

ssh -p 224 ubuntu@24.123.87.42

# **GitHub Repository**

- Repository: https://github.com/dfultonthebar/Sports-Bar-TV-Controller
- **Development Project Path:** /home/ubuntu/github\_repos/Sports-Bar-TV-Controller
- **Production Server Path:** /home/ubuntu/Sports-Bar-TV-Controller
- PM2 Process Name: sports-bar-tv
- GitHub Token: Stored securely in server environment (not documented for security)

# **Quick Deployment to Production**

```
# SSH into production server
ssh -p 224 ubuntu@24.123.87.42
# Navigate to project (PRODUCTION PATH)
cd /home/ubuntu/Sports-Bar-TV-Controller
# Pull latest changes
git pull origin main
# Install dependencies
npm install
# Generate Prisma Client
npx prisma generate
# Build application
npm run build
# Restart application (PM2 process name: sports-bar-tv)
pm2 restart sports-bar-tv
# Check logs
pm2 logs sports-bar-tv
```

# **AI System Access**

**IMPORTANT:** This section contains credentials for AI assistants to access and manage the system autonomously. These credentials are intentionally documented here for future AI access.

# **System Access Credentials**

• Web Interface: http://24.123.87.42:3000/

• **SSH Host:** 24.123.87.42

• SSH Port: 224

• SSH Username: ubuntu

• **SSH Password:** 6809233DjD\$\$\$ (THREE dollar signs)

• Project Directory: /home/ubuntu/Sports-Bar-TV-Controller

• GitHub Repository: https://github.com/dfultonthebar/Sports-Bar-TV-Controller

#### **Device Information**

• Fire TV Cube IP Address: 192.168.5.131

• Used for ADS bridge configuration

- Connected to network for remote control
- Integration with matrix switcher system

# **SSH Connection Command**

```
ssh -p 224 ubuntu@24.123.87.42
```

# **Quick Access for AI Assistants**

#### 1. Access System:

bash

ssh -p 224 ubuntu@24.123.87.42 # Password: 6809233DjD\$\$\$

#### 2. Navigate to Project:

bash

cd /home/ubuntu/Sports-Bar-TV-Controller

#### 3. View Application:

- Open browser to: http://24.123.87.42:3000/

#### 4. Manage Services:

```bash

# View logs

pm2 logs sports-bar-tv

# Restart application

pm2 restart sports-bar-tv

# Check status

pm2 status

٠.,

#### **Notes for AI Assistants**

- Password has THREE dollar signs at the end: 6809233DjD\$\$\$
- System runs on Intel NUC13ANHi5 hardware
- Application managed via PM2 process manager
- Database: PostgreSQL with Prisma ORM
- Web framework: Next.js 14 with TypeScript
- · Always pull latest changes before making modifications
- Use PM2 to restart after code updates

# **Database & Prisma Setup**

# **Database Configuration**

• Type: PostgreSQL

• Connection: Configured in . env file

• ORM: Prisma

#### **Prisma Commands**

```
# Generate Prisma Client
npx prisma generate

# Run migrations
npx prisma migrate dev

# Deploy migrations (production)
npx prisma migrate deploy

# Open Prisma Studio (database browser)
npx prisma studio

# Check migration status
npx prisma migrate status
```

### **Database Schema Location**

Schema File: prisma/schema.prismaMigrations: prisma/migrations/

# **Key Database Models**

- MatrixOutput TV display outputs
- MatrixInput Video sources
- WolfpackConfig Matrix switcher configuration
- AudioProcessor Atlas audio configuration
- IndexedFile Al Hub codebase files
- QAPair Al Hub Q&A training data
- TrainingDocument Al Hub training documents
- ApiKey Al provider API keys
- T0D0 Task management

# **Recent Fixes and Changes**

# October 16, 2025 - Critical Prisma and DirecTV Fixes

# 1. Prisma Singleton Pattern Fix (CRITICAL)

**Issue:** Multiple files were creating their own PrismaClient instances, causing "Cannot read properties of undefined (reading 'findMany')" errors.

Root Cause: When multiple PrismaClient instances are created in a Next.js application, it can lead to:

- Database connection pool exhaustion
- Ghost database connections
- Undefined prisma client references
- Memory leaks

**Solution:** Implemented singleton pattern across all files using Prisma.

#### Files Fixed (15 total):

- src/services/presetReorderService.ts

- src/lib/services/qa-uploader.ts
- src/lib/services/cec-discovery-service.ts
- src/lib/services/qa-generator.ts
- src/lib/atlas-meter-service.ts
- src/lib/scheduler-service.ts
- src/lib/firecube/sideload-service.ts
- src/lib/firecube/keep-awake-scheduler.ts
- src/lib/firecube/subscription-detector.ts
- src/lib/firecube/app-discovery.ts
- src/lib/firecube/sports-content-detector.ts
- src/lib/tvDocs/generateQA.ts
- src/lib/tvDocs/index.ts
- src/lib/ai-knowledge-ga.ts
- src/lib/ai-knowledge-enhanced.ts

#### Before:

```
import { PrismaClient } from '@prisma/client'
const prisma = new PrismaClient()
```

#### After:

```
import prisma from "@/lib/prisma"
// Using singleton prisma from @/lib/prisma
```

#### Singleton Implementation ( src/lib/prisma.ts ):

# Impact:

- V Eliminates "Cannot read properties of undefined" errors
- Prevents database connection pool exhaustion
- Improves application stability
- Reduces memory usage

# 2. DirecTV 403 Forbidden Error Handling (CRITICAL)

**Issue:** DirecTV receivers were returning HTTP 403 Forbidden errors when trying to send remote control commands.

**Root Cause:** DirecTV receivers have a security feature called "External Device Access" that must be enabled for the SHEF (Set-top Box HTTP Exported Functionality) API to work. When disabled, all API requests return 403 Forbidden.

Solution: Enhanced error handling to provide clear, actionable instructions when 403 errors occur.

#### **Changes Made:**

- 1. Enhanced src/app/api/directv-devices/send-command/route.ts:
  - Added specific 403 error detection
  - Provides step-by-step instructions to enable External Device Access
  - Added 404 error handling for unsupported receivers

#### 2. Updated src/lib/directv/shef-client.ts:

- Enhanced isShefEnabled() method with better error logging
- Provides console error messages with troubleshooting steps

#### **Error Messages:**

#### 403 Forbidden:

```
HTTP 403: External Device Access is disabled on the DirecTV receiver.

To enable: Press MENU on DirecTV remote → Settings & Help → Settings →
Whole-Home → External Device → Enable "External Access".

Then restart the receiver.
```

#### 404 Not Found:

HTTP 404: SHEF API endpoint not found. Verify the receiver supports network control and is using the correct firmware version.

#### **How to Enable External Device Access on DirecTV:**

- 1. Press **MENU** on the DirecTV remote
- 2. Navigate to Settings & Help
- 3. Select Settings
- 4. Go to Whole-Home
- 5. Select External Device
- 6. Enable "External Access"
- 7. Restart the DirecTV receiver (power cycle)
- 8. Test connection from Sports Bar TV Controller

#### **Supported DirecTV Receivers:**

- Genie HD DVR (HR44, HR54)
- HR24 HD DVR
- H24 HD Receiver
- Other SHEF-compatible receivers

#### Verification:

After enabling External Device Access, test the connection:

```
# From server
curl http://192.168.5.121:8080/info/getVersion
```

Should return JSON with receiver information instead of 403 error.

#### Impact:

- Clear error messages guide users to fix the issue
- Reduces troubleshooting time
- Documents the solution for future reference
- <a>Prevents confusion about network connectivity vs. security settings</a>

# **Previous Fixes (October 2025)**

### **CEC USB Adapter Integration**

- Migrated from CEC-over-IP to Pulse-Eight USB CEC adapter
- Updated to use /dev/ttyACMO device path
- Removed IP/Port fields from CEC configuration
- · Added USB device path field
- Implemented graceful error handling for CEC discovery

# **Matrix Configuration Persistence**

- Fixed matrix output configuration not saving
- Resolved dailyTurnOn/dailyTurnOff flag persistence
- Enhanced database schema for TV selection

#### **QA Generator Prisma Fix**

- Fixed Prisma singleton in qa-generator.ts (first instance of this issue)
- This fix was later applied to 14 additional files

# **System Overview**

The Sports Bar TV Controller is a comprehensive web application designed to manage TV displays, matrix video routing, and sports content scheduling for sports bar environments.

# **Technology Stack**

• Frontend: Next.js 14, React, TypeScript, Tailwind CSS

• Backend: Next.js API Routes, Prisma ORM

Database: PostgreSQLHardware Integration:

• Wolfpack HDMI Matrix Switchers (via HTTP API)

• Atlas AZMP8 Audio Processor (via HTTP API)

• Process Management: PM2

• Al Integration: Multiple Al providers (Ollama, Abacus Al, OpenAl, Anthropic, X.Al)

# **Application Features by Tab**

# 1. Dashboard (Home)

#### **Overview**

Main landing page providing quick access to all system features and current system status.

#### **Features**

- System Status "Server Online" indicator with operational status
- Quick Access Cards:
- Al Hub Unified Al management & assistance
- Sports Guide Find where to watch sports
- Remote Control Control TVs and audio systems
- System Admin Logs, backups, sync & tests

# **Navigation**

- Direct access to all major subsystems
- System health indicators
- Recent activity display

# **API Endpoints**

• N/A (frontend only)

# 2. Video Matrix / Matrix Control

# **Overview**

Comprehensive video routing system for managing HDMI matrix switchers and TV displays.

#### **Features**

# **Output Configuration**

- Outputs 1-4 (TV 01-04): Full matrix outputs with complete controls
- Power on/off toggle button (green when on, gray when off)
- Active/inactive checkbox
- Label field (TV 01, TV 02, TV 03, TV 04)
- Resolution dropdown (1080p, 4K, 720p)
- · Audio output field
- Full Wolfpack integration
- Outputs 5-32: Regular matrix outputs with full controls
- Outputs 33-36 (Matrix 1-4): Audio routing outputs with special controls
- Used for Atlas audio processor integration
- · Video input selection affects audio routing

# **Input Configuration**

- Configure 32 video sources
- Custom labeling (e.g., "Cable Box 1", "Apple TV")
- Enable/disable individual inputs

# **TV Selection System**

Granular control over which TVs participate in automated schedules:

- dailyTurnOn Boolean flag for morning schedule participation
- dailyTurnOff Boolean flag for "all off" command participation
- Configured per output in the database

# **API Endpoints**

# GET/POST /api/matrix/outputs

- GET: Retrieve all matrix outputs
- POST: Update output configuration
- **Body**: { outputNumber, label, enabled, dailyTurnOn, dailyTurnOff }

# GET /api/matrix/outputs-schedule

Retrieve outputs with schedule participation flags

#### POST /api/matrix/route

Route a source to an output:

```
{
    "input": 5,
    "output": 33
}
```

# POST /api/matrix/power

Control output power:

```
{
    "output": 33,
    "state": "on" // or "off"
}
```

#### POST /api/matrix/video-input-selection

Route video input to Matrix 1-4 audio outputs (33-36)

# **Database Schema**

# **MatrixOutput**

#### MatrixInput

# **Troubleshooting**

#### **Matrix Switching Not Working:**

- 1. Test connection in System Admin
- 2. Verify output/input configuration
- 3. Check Wolfpack matrix is powered on
- 4. Verify network connectivity
- 5. Test individual commands

# **TV Selection Not Working:**

- 1. Verify database migration status
- 2. Check output configuration flags
- 3. Restart application

# 3. Atlas / Audio Control

#### Overview

Multi-zone audio control system with Atlas AZMP8 processor integration.

#### **Features**

# **Atlas AZMP8 Configuration**

• IP Address: 192.168.5.101:80

- Model: AZMP8 (8 inputs, 8 outputs, 8 zones)
- Status: Online and authenticated

# **Configured Audio System**

### 7 Inputs:

- Matrix 1-4 (video input audio)
- Mic 1-2
- Spotify

#### 7 Outputs/Zones:

- Bar
- Bar Sub
- Dining Room
- Party Room West
- Party Room East
- Patio
- Bathroom

3 Scenes: Preset configurations for different scenarios

# **Dynamic Zone Labels**

- · Zone labels update automatically based on selected video input
- When video input is selected for Matrix 1-4, zone labels reflect the input name
- Example: Selecting "Cable Box 1" updates zone label from "Matrix 1" to "Cable Box 1"
- Falls back to "Matrix 1-4" when no video input selected

### **Features**

- Real-time zone control
- Volume adjustment per zone
- Input selection per zone
- Scene management
- Configuration upload/download
- Automatic timestamped backups

# **API Endpoints**

# **GET** /api/audio-processor

Get all configured audio processors

# POST /api/atlas/upload-config

Upload configuration to Atlas processor

# **GET** /api/atlas/download-config

Download current configuration from Atlas processor

#### **POST** /api/atlas/route-matrix-to-zone

Route audio from matrix output to zone

# **GET** /api/atlas/ai-analysis

Get Al-powered analysis of audio system performance

# **Configuration Management**

#### **Configuration File Location:**

- Primary: /home/ubuntu/github\_repos/Sports-Bar-TV-Controller/data/atlas-configs/cmgjx-a5ai000260a7xuiepjl.json
- Backups: /home/ubuntu/github\_repos/Sports-Bar-TV-Controller/data/atlas-configs/cmgjx-a5ai000260a7xuiepjl backup \*.json

#### **Backup Strategy:**

- Automatic backup created on every upload
- Timestamped filename format
- Manual restore by copying backup to primary config file

### **Database Schema**

# **Troubleshooting**

#### **Atlas Shows Offline:**

- 1. Check network connectivity: ping 192.168.5.101
- 2. Verify configuration file exists
- 3. Check processor is powered on
- 4. Restore from backup if needed

# **Configuration Not Loading:**

- 1. Validate JSON configuration file
- 2. Check file permissions
- 3. Restore from most recent backup

# 4. Al Hub

# **Overview**

Unified AI management system providing intelligent assistance, codebase analysis, device insights, and AI configuration.

#### **Current Status**

Testing Date: October 15, 2025

Overall Status: A PARTIALLY FUNCTIONAL

**Critical Issues:** 2 **Features Tested:** 7

Working Features: 5
Broken Features: 2

#### Features & Status

# Al Assistant Tab (Partially Working)

Status: Chat interface works, Codebase sync fails

#### **Chat Interface:**

- V Status: WORKING

- **Performance Issue:** Response time is slow (15+ seconds)

- Functionality: Successfully answers questions about the codebase

- Features:

- Natural language queries

- Codebase context awareness

- Troubleshooting assistance
- Code explanations

#### **Sync Codebase:**

- X Status: FAILING

- Error: GET http://24.123.87.42:3000/api/ai-assistant/index-codebase 404 (Internal Server

Error)

- Impact: Cannot index codebase for AI analysis

- Priority: CRITICAL - Fix immediately

# ▼ Teach AI Tab (UI Works, Backend Fails)

#### **Upload Documents:**

- **W UI Status:** WORKING

- **Supported Formats:** PDF, Markdown (.md), Text (.txt)

- Features:

- Drag and drop file upload

- Multiple file support

- File type validation

- Note: Upload errors observed, needs further testing

# **Q&A Training:**

- X Status: FAILING

- Error: Database error: Failed to create Q&A entry

- Console Error: 500 (Internal Server Error) for api/qa-entries.ts

- Impact: Users cannot add Q&A training pairs

- Priority: CRITICAL - Fix immediately

- Features (Non-functional):

- Category selection (General, Technical, Troubleshooting, etc.)
- Question/Answer input fields
- Entry management
- Generate from Repository
- Generate from Docs
- Upload Q&A File

#### Test AI:

- **W UI Status:** WORKING

- Features:

- Test question input
- AI response testing
- Testing tips and guidance
- Note: Cannot fully test without training data

#### **Statistics Display:**

- Documents: 0 - O&A Pairs: 0

- Total Content: 0 Bytes

- Last Updated: 10/15/2025, 1:00:06 AM

# Enhanced Devices Tab (Working)

Status: V FULLY FUNCTIONAL

#### **Features:**

- Device AI Assistant for intelligent insights
- Filter options:
- All Devices dropdown
- Time range filter (Last 24 Hours)
- Refresh button
- Tabs:
- Smart Insights
- Performance
- Recommendations
- Predictions
- Current State: "No Al insights available for the selected criteria"

# Configuration Tab (Working)

Status: V FULLY FUNCTIONAL

#### **Provider Statistics:**

- 1 Active Local Service
- 3 Cloud APIs Ready
- 5 Inactive Local Services

#### **Local AI Services:**

- V Ollama (http://localhost:11434/api/tags, Model: phi3:mini) Active (4ms)
- X Custom Local AI (http://localhost:8000/v1/models) Error
- X LocalAI (http://localhost:8080/v1/models) Error
- X LM Studio (http://localhost:1234/v1/models) Error
- X Text Generation WebUI (http://localhost:5000/v1/models) Error
- X Tabby (http://localhost:8080/v1/models) Error

#### **Cloud AI Services:**

- **OpenAI** Ready (API key configured)
- **Anthropic Claude** Ready (API key configured)
- X.AI Grok Ready (API key configured)
- Abacus AI Not Configured (No API key)

#### Features:

- Al System Diagnostics (expandable)
- Provider status monitoring

- Refresh status button
- Local AI setup guide

# **✓** API Keys Tab (Working)

Status: V FULLY FUNCTIONAL

#### **Features:**

- API key management interface
- Configured API Keys display (currently 0)
- Add API Key button
- Provider documentation links:
- Ollama (Local) RECOMMENDED
- Abacus Al
- OpenAl
- LocalAI
- Custom Local AI
- Local AI Services Status:
- Port 8000: Active (Custom service detected)
- Port 11434: Check if Ollama is running
- Port 8080: Check if LocalAI is running

#### **AI Assistant Features Listed:**

- Equipment Troubleshooting
- System Analysis
- Configuration Assistance
- Sports Guide Intelligence
- Operational Insights
- Proactive Monitoring

### **Database Schema**

```
model IndexedFile {
  id
                             @id @default(cuid())
                   String
  filePath
                  String
                             @unique
  fileName
                   String
  fileType
                   String
  content
                   String
                             @db.Text
  fileSize
                   Int
  lastModified DateTime
  lastIndexed DateTime @default(now())
  hash String
isActive Boolean @default(true)
createdAt DateTime @default(now())
updatedAt DateTime @updatedAt
}
model QAPair {
 id String @id @defa
question String @db.Text
answer String @db.Text
context String? @db.Text
source String?
category String?
                           @id @default(cuid())
  isActive Boolean @default(true)
  createdAt DateTime @default(now())
  updatedAt     DateTime @updatedAt
}
model TrainingDocument {
                           @id @default(cuid())
  id
                String
  title
                String
  content
              String
                           @db.Text
  fileType String
  fileSize
               Int
  category String?
isActive Boolean @default(true)
  createdAt
updatedAt
DateTime @default(now())
DateTime @updatedAt
model ApiKey {
                           @id @default(cuid())
  id
                String
  provider
               String
  keyName
                String
  apiKey
                String
  isActive
                Boolean @default(true)
  createdAt DateTime @default(now())
  @@unique([provider, keyName])
}
```

# **API Endpoints**

POST /api/ai-assistant/index-codebase

X Status: BROKEN (404 error)
Index codebase files for Al analysis

# POST /api/ai-assistant/chat

✓ **Status:** WORKING (slow) Chat with Al about codebase

#### **POST** /api/ai/qa-generate

Generate Q&A pairs from repository

# **POST** /api/ai/qa-entries

X Status: BROKEN (500 error)
Create Q&A training entries

# **GET/POST** /api/api-keys

✓ Status: WORKING

Manage AI provider API keys

### **POST** /api/devices/ai-analysis

Get AI insights for devices

#### Critical Issues & Fix Plan

# CRITICAL #1: Q&A Training Database Error

**API:** POST /api/ai/qa-entries returns 500 error **Impact:** Users cannot add Q&A training pairs

#### Fix Steps:

- 1. Check database schema for QAPair table
- 2. Verify Prisma migrations are up to date
- 3. Review API route handler ( src/app/api/ai/qa-entries/route.ts )
- 4. Check database connection and write permissions
- 5. Add proper error logging
- 6. Test with various Q&A entry formats

Priority: Fix immediately before production use

# CRITICAL #2: Codebase Indexing 404 Error

**Error:** GET http://24.123.87.42:3000/api/ai-assistant/index-codebase 404

Impact: Cannot index codebase for AI assistance

#### Fix Steps:

- 1. Verify API route exists in correct location
- 2. Check route file naming (should be route.ts in app router)
- 3. Ensure proper HTTP method handling (GET/POST)
- 4. Implement codebase indexing logic if missing
- 5. Test with actual project directory
- 6. Add proper error responses

Priority: Fix immediately for full AI Hub functionality

# HIGH PRIORITY: Chat Performance

**Issue:** 15+ second response time **Impact:** Poor user experience

#### **Optimization Steps:**

- 1. Profile AI model response time
- 2. Implement streaming responses
- 3. Add response caching for common questions
- 4. Consider faster AI model for simple queries
- 5. Optimize context window size
- 6. Add better loading indicators



#### MEDIUM PRIORITY: Local AI Services

**Issue:** 5 local Al services showing error status

#### Services to Fix:

- Custom Local AI (port 8000)
- LocalAI (port 8080)
- LM Studio (port 1234)
- Text Generation WebUI (port 5000)
- Tabby (port 8080 port conflict?)

#### Fix Steps:

- 1. Verify each service is installed
- 2. Check if services are running
- 3. Update service URLs in configuration
- 4. Add health check with retry logic
- 5. Document installation instructions
- 6. Consider making local services optional

# Recommendations

#### **Immediate Actions:**

- 1. Fix Q&A Training database error (CRITICAL)
- 2. Fix Codebase Indexing 404 error (CRITICAL)
- 3. Test document upload feature thoroughly
- 4. Add proper error messages and user feedback

#### **Short-term Improvements:**

- 1. Optimize chat response performance
- 2. Implement streaming responses
- 3. Add progress indicators
- 4. Configure local AI services

### **Long-term Enhancements:**

- 1. Add training data export/import
- 2. Implement batch Q&A generation
- 3. Add training quality metrics
- 4. Enhanced device insights with more data

# **Testing Report**

■ Detailed Testing Report: /home/ubuntu/ai hub testing report.md

# 5. Sports Guide

#### **Overview**

Simplified sports programming guide using The Rail Media API as the ONLY data source. All previous data sources (ESPN, TheSportsDB, Spectrum, etc.) have been removed for simplicity and maintainability.

**Version:** 4.0.0 - Simplified Implementation

Last Updated: October 16, 2025

Data Source: The Rail Media API ONLY

# **Key Changes (Version 4.0.0)**

# **Simplified Architecture**

• REMOVED: ESPN API integration

• REMOVED: TheSportsDB API integration

• REMOVED: Spectrum Channel Service

• REMOVED: Sunday Ticket Service

• REMOVED: Enhanced streaming sports service

• REMOVED: Mock data generation

• REMOVED: Multiple hardcoded channel lists

• KEPT: The Rail Media API as the ONLY data source

# **Benefits of Simplification**

- Single source of truth for all sports programming data
- Reduced code complexity (600+ lines → 300 lines)
- · Easier maintenance and debugging
- Consistent data format
- No API conflicts or data merging issues
- Comprehensive verbose logging for debugging

#### **Features**

#### **Core Functionality**

- Sports Programming Guide: Real-time sports TV guide data from The Rail Media
- Date Range Filtering: Query specific date ranges or number of days ahead
- Lineup Filtering: Filter by satellite, cable, or streaming lineup
- Search Functionality: Search for specific teams, leagues, or sports
- Comprehensive Logging: Verbose logging for all operations
- Ollama Integration: Al-powered query and analysis capabilities

#### Supported Lineups

- SAT Satellite providers
- DRTV DirecTV
- DISH Dish Network
- CABLE Cable providers
- STREAM Streaming services

# **API Configuration**

Provider: The Rail Media

API Endpoint: https://guide.thedailyrail.com/api/v1

**User ID: 258351** 

API Key: Configured in .env file

#### **Environment Variables**

```
SPORTS_GUIDE_API_KEY=12548RK0000000d2bb701f55b82bfa192e680985919
SPORTS_GUIDE_USER_ID=258351
SPORTS_GUIDE_API_URL=https://guide.thedailyrail.com/api/v1
```

# **API Endpoints**

# POST /api/sports-guide

Fetch sports programming guide from The Rail Media API

#### **Request Body:**

```
"startDate": "2025-10-16", // Optional: YYYY-MM-DD format
"endDate": "2025-10-23", // Optional: YYYY-MM-DD format
"days": 7, // Optional: Number of days from today
"lineup": "SAT", // Optional: Filter by lineup (SAT, DRTV, etc.)
"search": "NBA" // Optional: Search term (team, league, sport)
}
```

# Response:

```
"success": true,
  "requestId": "abc123",
  "dataSource": "The Rail Media API",
  "apiProvider": {
    "name": "The Rail Media",
    "url": "https://guide.thedailyrail.com/api/v1",
    "userId": "258351"
  },
  "fetchMethod": "fetchDateRangeGuide (7 days)",
  "data": {
    "listing_groups": [...]
  "statistics": {
    "totalListingGroups": 42,
    "totalListings": 156,
    "appliedFilters": [],
    "generatedAt": "2025-10-16T..."
  "filters": {
    "startDate": null,
    "endDate": null,
    "days": 7,
    "lineup": null,
    "search": null
 }
}
```

# **GET** /api/sports-guide

Get API information, status, and available endpoints

#### Response:

```
"success": true,
  "requestId": "xyz789",
  "version": "4.0.0",
  "name": "Simplified Sports Guide API",
  "description": "Sports programming guide using ONLY The Rail Media API",
  "dataSource": {
    "provider": "The Rail Media",
    "url": "https://guide.thedailyrail.com/api/v1",
   "userId": "258351",
   "apiKeySet": true,
    "configured": true
  },
  "endpoints": {...},
  "features": [...],
  "logging": {
    "enabled": true,
   "location": "PM2 logs (pm2 logs sports-bar-tv)",
   "format": "[timestamp] [Sports-Guide] LEVEL: message",
   "levels": ["INFO", "ERROR", "DEBUG"]
 },
  "supportedLineups": [...]
}
```

#### **GET** /api/sports-guide?action=test-connection

Test The Rail Media API connection

# Response:

```
"success": true,
"requestId": "test123",
"connectionTest": {
    "valid": true,
    "message": "API key is valid and working"
},
"timestamp": "2025-10-16T..."
}
```

#### **GET** /api/sports-guide/status

Get current API configuration status

#### Response:

```
"success": true,
"configured": true,
"apiUrl": "https://guide.thedailyrail.com/api/v1",
"userId": "258351",
"apiKeySet": true,
"apiKeyPreview": "12548RK0...5919"
}
```

# POST /api/sports-guide/verify-key

Verify API key validity

# **Request Body:**

```
{
  "apiKey": "your-api-key",
  "userId": "your-user-id"
}
```

# POST /api/sports-guide/update-key

Update API key (with validation)

### **Request Body:**

```
{
  "apiKey": "new-api-key",
  "userId": "new-user-id"
}
```

# **Ollama Al Integration**

The Sports Guide now includes comprehensive AI integration using Ollama for intelligent querying and analysis.

# **Ollama Configuration**

- Host: http://localhost:11434 (configurable via OLLAMA HOST)
- Model: phi3:mini (configurable via OLLAMA\_MODEL )
- Status: Active and operational

# **Ollama API Endpoints**

POST /api/sports-guide/ollama/query

Query Ollama about sports guide functionality

# **Default Query:**

```
{
  "query": "What sports games are on TV tonight?",
  "includeRecentLogs": true
}
```

# **Analyze Logs:**

```
{
    "action": "analyze-logs"
}
```

#### **Get Recommendations:**

```
{
  "action": "get-recommendations",
  "userPreferences": {
    "favoriteTeams": ["Green Bay Packers", "Milwaukee Bucks"],
    "favoriteLeagues": ["NFL", "NBA"],
    "location": "Green Bay, Wisconsin"
  }
}
```

#### **Test Connection:**

```
{
  "action": "test-connection"
}
```

# **GET** /api/sports-guide/ollama/query

Test Ollama connectivity

# Response:

```
{
  "success": true,
  "message": "Ollama is online and accessible",
  "model": "phi3:mini",
  "responseTime": 45
}
```

# **Ollama Features**

### 1. Intelligent Query Answering

- Natural language questions about sports programming
- Context-aware responses using recent logs
- Comprehensive system knowledge

#### 2. Log Analysis

- Automatic analysis of sports guide logs
- System health assessment
- Error detection and reporting
- Usage pattern identification

# 3. Personalized Recommendations

- Sports programming recommendations based on user preferences
- Location-based suggestions
- Team and league-specific recommendations

#### 4. Debug Assistance

- Help troubleshooting issues

- Explain error messages
- Suggest solutions based on logs

# **Comprehensive Logging**

All sports guide operations are logged with comprehensive detail for debugging and monitoring.

# **Log Format**

```
[2025-10-16T12:34:56.789Z] [Sports-Guide] LEVEL: message
```

# **Log Levels**

- INFO: General information about operations
- ERROR: Error conditions and failures
- **DEBUG:** Detailed debugging information

# **Log Locations**

- PM2 Output Log: ~/.pm2/logs/sports-bar-tv-out.log
- PM2 Error Log: ~/.pm2/logs/sports-bar-tv-error.log

# **Viewing Logs**

#### **Real-time logs:**

```
pm2 logs sports-bar-tv
```

# Filter for Sports Guide logs:

```
pm2 logs sports-bar-tv | grep "Sports-Guide"
```

#### View specific log file:

```
tail -f ~/.pm2/logs/sports-bar-tv-out.log | grep "Sports-Guide"
```

#### Search logs:

```
cat ~/.pm2/logs/sports-bar-tv-out.log | grep "Sports-Guide" | grep "ERROR"
```

# **Logged Operations**

- Request Processing: Every API request with unique request ID
- API Calls: The Rail API requests with parameters
- Data Fetching: Method used and response statistics
- Filtering: Applied filters and results
- Errors: Detailed error information with stack traces
- Statistics: Request counts, processing times, data volumes

# **Configuration Management**

# **Viewing Current Configuration**

1. Navigate to Sports Guide Configuration page

- 2. Click "API" tab
- 3. View current User ID and masked API Key
- 4. Check configuration status indicator

# **Updating Configuration**

#### Via UI:

- 1. Navigate to Sports Guide Configuration
- 2. Click "API" tab
- 3. Enter new User ID and API Key
- 4. Click "Verify API Key" to test
- 5. Click "Save Configuration"
- 6. Restart server for changes to take effect

#### **Via Command Line:**

```
# SSH into server
ssh -p 224 ubuntu@24.123.87.42

# Edit .env file
nano /home/ubuntu/Sports-Bar-TV-Controller/.env

# Update values:
# SPORTS_GUIDE_API_KEY=your-new-key
# SPORTS_GUIDE_USER_ID=your-new-user-id

# Restart application
pm2 restart sports-bar-tv
```

# **Security**

- API Keys: Stored only in .env file (never in repository)
- **Key Masking:** UI shows only first 8 and last 4 characters
- Validation: API keys validated before saving
- Server-side Only: All API calls made from server, never client
- Environment Variables: Secure storage of sensitive credentials

# **Testing**

#### **Test API Connection**

```
curl http://24.123.87.42:3000/api/sports-guide?action=test-connection
```

#### Fetch Today's Guide

```
curl -X POST http://24.123.87.42:3000/api/sports-guide \
  -H "Content-Type: application/json" \
  -d '{}'
```

# Fetch 7-Day Guide

```
curl -X POST http://24.123.87.42:3000/api/sports-guide \
  -H "Content-Type: application/json" \
  -d '{"days": 7}'
```

#### Search for NBA Games

```
curl -X POST http://24.123.87.42:3000/api/sports-guide \
  -H "Content-Type: application/json" \
  -d '{"search": "NBA", "days": 3}'
```

# Filter by DirecTV Lineup

```
curl -X POST http://24.123.87.42:3000/api/sports-guide \
  -H "Content-Type: application/json" \
  -d '{"lineup": "DRTV", "days": 1}'
```

#### **Test Ollama Connection**

```
curl http://24.123.87.42:3000/api/sports-guide/ollama/query
```

# **Query Ollama**

```
curl -X POST http://24.123.87.42:3000/api/sports-guide/ollama/query \
  -H "Content-Type: application/json" \
  -d '{"query": "What NFL games are on TV this week?"}'
```

#### **Get AI Recommendations**

```
curl -X POST http://24.123.87.42:3000/api/sports-guide/ollama/query \
   -H "Content-Type: application/json" \
   -d '{
      "action": "get-recommendations",
      "userPreferences": {
        "favoriteTeams": ["Green Bay Packers"],
        "favoriteLeagues": ["NFL"]
      }
}'
```

# **Troubleshooting**

#### Issue: "The Rail Media API not configured"

#### **Solution:**

- 1. Check .env file has SPORTS GUIDE API KEY and SPORTS GUIDE USER ID
- 2. Verify values are correct
- 3. Restart application: pm2 restart sports-bar-tv

#### Issue: "API key is invalid or unauthorized"

#### Solution:

- 1. Verify API key is correct in .env file
- 2. Test API key using /api/sports-guide?action=test-connection
- 3. Contact The Rail Media support if key is correct but still failing

#### Issue: No data returned

### **Solution:**

- 1. Check PM2 logs: pm2 logs sports-bar-tv | grep "Sports-Guide"
- 2. Verify date range is valid

- 3. Try fetching without filters first
- 4. Check The Rail Media API status

#### **Issue: Ollama queries failing**

#### **Solution:**

- 1. Verify Ollama is running: curl http://localhost:11434/api/tags
- 2. Check Ollama model is downloaded: ollama list
- 3. Restart Ollama if needed: systemctl restart ollama (if using systemd)
- 4. Check logs for detailed error messages

### **Issue: Slow response times**

#### **Solution:**

- 1. Check network connectivity to The Rail Media API
- 2. Review logs for performance issues
- 3. Consider reducing date range for queries
- 4. Use Ollama to analyze logs for performance patterns

# **Migration Notes**

# **Upgrading from Version 3.x**

#### What Changed:

- Removed all data sources except The Rail Media API
- Simplified API interface
- Added comprehensive logging
- Added Ollama AI integration
- Removed hardcoded channel lists

#### **Migration Steps:**

- 1. Ensure The Rail Media API credentials are configured in .env
- 2. Update any frontend code that relied on old API response format
- 3. Test all sports guide functionality
- 4. Review logs to ensure proper operation
- 5. Update any custom integrations

#### **Breaking Changes:**

- Response format changed to focus on The Rail API data structure
- Removed mock data fallbacks
- Removed multi-source data merging
- Changed API response schema

#### **Future Enhancements**

#### **Planned Features:**

- Enhanced caching for frequently accessed data
- Webhook support for real-time updates
- User preference storage
- Advanced filtering options
- Integration with other system features (matrix routing, etc.)
- Mobile app support
- Push notifications for favorite teams

# Support

For issues with The Rail Media API:

- Website: https://guide.thedailyrail.com
- Support: Contact The Rail Media support team

For Sports Bar TV Controller issues:

- **Logs:** pm2 logs sports-bar-tv | grep "Sports-Guide"
- GitHub Issues: https://github.com/dfultonthebar/Sports-Bar-TV-Controller/issues
- Ollama Assistant: Use /api/sports-guide/ollama/query to ask questions

Last Updated: October 16, 2025

Version: 4.0.0 - Simplified Implementation Data Source: The Rail Media API Only

# **6. Streaming Platforms**

#### **Overview**

Management interface for streaming service accounts and configurations.

#### **Features**

- · Platform account management
- Service configuration
- Integration settings

# 7. DirecTV Integration

# **Overview**

Integration with DirecTV receivers for sports bar TV control using the SHEF (Set-top Box HTTP Exported Functionality) protocol. The system allows adding, managing, and monitoring DirecTV receivers, retrieving device status and channel information, and routing them through the matrix switcher.

#### **SHEF Protocol Information**

#### **SHEF (Set-top Box HTTP Exported Functionality)**

- Protocol Version: 1.12 (current H24/100 receiver)
- Documentation Version: 1.3.C (October 2011)
- Port: 8080 (default HTTP API port)
- Protocol: HTTP REST API- Response Format: JSON

#### **Protocol Capabilities:**

- V Device information (version, serial number, mode)
- <a>Current channel and program information</a>
- Remote control simulation (channel change, key presses)
- V Program guide data for specific channels
- V Device location information (multi-room setups)

#### **Protocol Limitations:**

- X NO subscription/package information
- X NO account details or billing data
- X NO entitled channels list
- X NO premium package status

#### Why Subscription Data is Unavailable:

The SHEF API is designed for device control, not account management. Subscription data lives in DirecTV's cloud systems and would require integration with DirecTV's official business API, which is separate from the receiver's local HTTP API.

### **Current Status**

Last Updated: October 16, 2025, 7:08 PM
Overall Status: ✓ FULLY FUNCTIONAL

#### **Working Features:**

- Receiver management and configuration
- Device connectivity testing
- Real-time device status monitoring
- Current channel and program information
- V Device information display (receiver ID, access card, software version)
- Matrix switcher integration

#### Fix Applied (October 15, 2025):

- Fixed subscription polling to correctly handle SHEF API limitations
- Removed incorrect logic that tried to parse API commands as subscription data
- Now displays real device information instead of attempting to fetch unavailable subscription data
- Shows receiver ID, access card ID, current channel, and program information

# **SHEF API Endpoints**

The DirecTV SHEF protocol provides the following HTTP endpoints on port 8080:

#### **Device Information Endpoints**

#### **GET** /info/getVersion

- Returns device version, receiver ID, access card ID, software version, and SHEF API version
- Example: http://192.168.5.121:8080/info/getVersion
- Response includes: receiverId , accessCardId , stbSoftwareVersion , version , systemTime

#### GET /info/getSerialNum

- Returns device serial number
- Example: http://192.168.5.121:8080/info/getSerialNum

#### **GET** /info/mode

- Returns device operational mode (0 = active, other values = standby/off)
- Example: http://192.168.5.121:8080/info/mode

#### **GET** /info/getLocations

- Lists available client locations for multi-room setups
- Example: http://192.168.5.121:8080/info/getLocations

#### **GET** /info/getOptions

- Returns list of available API commands (NOT subscription data)
- This endpoint was previously misunderstood to provide subscription information

- Actually returns a list of API endpoints with their descriptions and parameters
- Example: http://192.168.5.121:8080/info/getOptions

# **TV Control Endpoints**

#### **GET** /tv/getTuned

- Returns currently tuned channel and program information
- Example: http://192.168.5.121:8080/tv/getTuned
- Response includes: major, minor, callsign, title, programId, rating, etc.

#### GET /tv/getProgInfo?major=<channel>&time=<timestamp>

- Returns program information for a specific channel at a given time
- Parameters: major (required), minor (optional), time (optional)
- Example: http://192.168.5.121:8080/tv/getProgInfo?major=202

#### **GET** /tv/tune?major=<channel>&minor=<subchannel>

- Tunes to a specific channel
- Parameters: major (required), minor (optional)
- Example: http://192.168.5.121:8080/tv/tune?major=202

#### **Remote Control Endpoints**

#### **GET** /remote/processKey?key=<keyname>

- Simulates pressing a remote control button
- Parameters: key (required) button name (e.g., "power", "menu", "chanup", "chandown")
- Example: http://192.168.5.121:8080/remote/processKey?key=power
- Available keys: power, poweron, poweroff, format, pause, rew, replay, stop, advance, ffwd, record, play, guide, active, list, exit, back, menu, info, up, down, left, right, select, red, green, yellow, blue, chanup, chandown, prev, 0-9, dash, enter

#### GET /serial/processCommand?cmd=<hex command>

- Sends a raw serial command to the receiver (advanced users only)
- Parameters: cmd (required) hexadecimal command string

#### **Deprecated Endpoints (Do Not Use)**

GET /dvr/getPlaylist - Deprecated in SHEF v1.3.C
GET /dvr/play - Deprecated in SHEF v1.3.C

#### **Features**

#### **Receiver Management**

- Add DirecTV Receivers: Configure receivers with IP address, port, and receiver type
- Matrix Integration: Assign receivers to specific matrix input channels (1-32)
- Connection Testing: Test connectivity to DirecTV receivers
- Subscription Data: Retrieve active subscriptions and sports packages
- Status Monitoring: Real-time connection status indicators

### **Receiver Configuration**

- **Device Name:** Custom label for identification
- IP Address: Network address of DirecTV receiver
- Port: Default 8080 (DirecTV API port)
- Receiver Type: Genie HD DVR, HR24, etc.
- Matrix Input Channel: SELECT dropdown with 32 input channels

- Format: "Input 1: Cable Box 1 (Cable Box)"
- Links receiver to specific matrix input for routing

# **Testing Results (October 15, 2025)**

# Successful Operations

#### 1. Receiver Creation (PASSED)

- Successfully created DirecTV receivers with full configuration
- Matrix Input Channel field is functional as SELECT dropdown
- All 32 matrix input channels available in dropdown
- Receiver appears in UI with proper configuration
- Status indicator shows "Connected" (green checkmark)

#### 2. Receiver Deletion (PASSED)

- Successfully removed multiple receivers (tested with 9 receivers)
- Deletion confirmation dialog appears for each receiver
- Each deletion processed successfully
- UI updates correctly after each deletion

#### 3. Form Validation (PASSED)

- IP address validation working correctly
- Port number validation (default 8080)
- Matrix input channel selection functional
- All form fields properly integrated with React state

# X Failed Operations & Known Issues

#### 1. Subscription Data Retrieval (FAILED)

- **Status:** X FAILS when no physical receiver present
- Error Message: "Polling Failed Unable to connect to DirecTV receiver"
- Dialog Display:
- Title: "Device Subscriptions [Receiver Name]"
- Error Badge: Red "Error" indicator
- Error Message: "Polling Failed Unable to connect to DirecTV receiver"
- Active Subscriptions: 0
- Sports Packages: 0
- Last Updated: Timestamp

#### 2. Connection Test Results

- Visual Indicator: Shows "Connected" (green) in UI
- Actual Status: Cannot verify without physical hardware
- **Limitation:** UI may show connected even when receiver is unreachable

# **Error Messages & Diagnostics**

# **Subscription Polling Error**

Error: Unable to connect to DirecTV receiver

Status: Polling Failed Active Subscriptions: 0 Sports Packages: 0

Timestamp: [Date/Time of polling attempt]

#### **Root Causes:**

- 1. No Physical Device: IP address has no actual DirecTV receiver
- 2. **Network Connectivity:** Receiver unreachable from server network
- 3. Receiver Offline: Device powered off or disconnected
- 4. Firewall/Port Blocking: Port 8080 blocked by network firewall
- 5. API Endpoint Issue: Backend API connection problems

# Form Input Handling Issues

During testing, direct typing in React form fields did not update state properly. Workaround implemented using native JavaScript:

```
const nativeInputValueSetter = Object.getOwnPropertyDescriptor(
  window.HTMLInputElement.prototype, "value"
).set;
nativeInputValueSetter.call(inputElement, 'value');
inputElement.dispatchEvent(new Event('input', { bubbles: true }));
```

# **Verbose Logging Implementation**

The DirecTV system includes comprehensive logging for debugging and monitoring:

### **Log Locations**

```
    PM2 Logs: pm2 logs sports-bar-tv
    Log Files: /home/ubuntu/.pm2/logs/
    sports-bar-tv-out.log - Standard output
    sports-bar-tv-error.log - Error output
```

#### **Logged Operations**

#### **Receiver Creation:**

```
[DirecTV] Creating new receiver: Test DirecTV
[DirecTV] IP: 192.168.5.121, Port: 8080
[DirecTV] Matrix Channel: 1 (Input 1: Cable Box 1)
[DirecTV] Receiver created successfully
```

# **Connection Testing:**

```
[DirecTV] Testing connection to 192.168.5.121:8080
[DirecTV] Connection attempt: [SUCCESS/FAILED]
[DirecTV] Response time: [X]ms
```

#### **Subscription Polling:**

```
[DirecTV] Polling subscriptions for receiver: Test DirecTV
[DirecTV] API endpoint: http://192.168.5.121[:]8080/api/subscriptions
[DirecTV] ERROR: Unable to connect to DirecTV receiver
[DirecTV] Error details: [Connection timeout/Network unreachable/etc.]
```

### **Receiver Deletion:**

```
[DirecTV] Deleting receiver: Test DirecTV (ID: xxx)
[DirecTV] Receiver deleted successfully
```

### **Accessing Logs**

#### **View Real-time Logs:**

```
pm2 logs sports-bar-tv
```

### **View Specific Log File:**

```
tail -f ~/.pm2/logs/sports-bar-tv-out.log
tail -f ~/.pm2/logs/sports-bar-tv-error.log
```

#### **Search Logs for DirecTV Events:**

```
pm2 logs sports-bar-tv | grep DirecTV
cat ~/.pm2/logs/sports-bar-tv-out.log | grep "DirecTV"
```

# **UI Components & Behavior**

#### **Receiver Card Interface**

When a DirecTV receiver is selected, three action buttons appear:

- 1. Purple Button (Leftmost): Retrieve subscription data
- 2. Blue Button (Middle): Additional functionality (TBD)
- 3. Red/Orange Button (Rightmost): Delete receiver

# **Status Indicators**

- Green Checkmark: "Connected" status
- Red Badge: Error or disconnected status
- Loading Spinner: Operation in progress

# **Matrix Input Channel Field**

- Type: SELECT dropdown (not text input)
- Position: Second select element in form
- Options: 32 channels with descriptive labels
- Value Format: String numbers "1" through "32"
- Label Format: "Input [N]: [Label] ([Type])"

# **API Endpoints**

### **POST** /api/directv/receivers

Create a new DirecTV receiver configuration.

#### **Request Body:**

```
"deviceName": "Test DirecTV",
"ipAddress": "192.168.5.121",
"port": 8080,
"receiverType": "Genie HD DVR",
"matrixInputChannel": 1
}
```

#### Response:

```
"success": true,
"receiver": {
    "id": "xxx",
    "deviceName": "Test DirecTV",
    "ipAddress": "192.168.5.121",
    "port": 8080,
    "receiverType": "Genie HD DVR",
    "matrixInputChannel": 1,
    "connected": true,
    "createdAt": "2025-10-15T18:10:00.000Z"
}
```

# **GET** /api/directv/receivers

Retrieve all configured DirecTV receivers.

# **DELETE** /api/directv/receivers/[id]

Delete a specific DirecTV receiver.

# POST /api/directv/test-connection

Test connection to a DirecTV receiver.

#### **Request Body:**

```
{
   "receiverId": "xxx"
}
```

# Response:

```
{
  "success": true,
  "connected": true,
  "responseTime": 45
}
```

# POST /api/directv/subscriptions

Retrieve subscription data from DirecTV receiver.

# Request Body:

```
{
  "receiverId": "xxx"
}
```

#### Response (Success):

#### **Response (Error):**

```
"success": false,
"error": "Unable to connect to DirecTV receiver",
"activeSubscriptions": 0,
"sportsPackages": 0,
"lastUpdated": "2025-10-15T18:10:26.000Z"
}
```

#### **Database Schema**

```
model DirecTVReceiver {
                   String @id @default(cuid())
 deviceName
                   String
                  String
 ipAddress
 port
                  Int
                            @default(8080)
 receiverType
                   String
 matrixInputChannel Int
 connected Boolean @default(false)
 lastConnected DateTime?
 activeSubscriptions Int?
 sportsPackages Int?
 lastPolled
                 DateTime?
DateTime @default(now())
 createdAt
 updatedAt
                  DateTime @updatedAt
 @@unique([ipAddress, port])
}
```

# **Known Issues & Limitations**

# 1. Physical Hardware Required

**Issue:** Subscription polling and advanced features require actual DirecTV hardware **Impact:** Cannot fully test or use subscription features without physical receiver **Workaround:** UI and management features work independently of hardware **Status:** EXPECTED BEHAVIOR - Not a bug

# 2. Connection Status Ambiguity

Issue: UI may show "Connected" status even when receiver is unreachable

Impact: Users may be misled about actual device connectivity

Recommendation: Implement periodic health checks and more accurate status reporting

**Priority: MEDIUM** 

### 3. Form Input React State Sync

**Issue:** Direct typing in form fields may not update React state **Impact:** Values may not save properly on form submission

Workaround: Use native JavaScript input setter with event dispatch

Status: Workaround implemented, consider fixing React state management

**Priority: LOW** 

#### 4. Network Topology Dependency

Issue: Server must be on same network as DirecTV receivers

Impact: Cannot manage receivers on different VLANs/subnets without routing

Recommendation: Document network requirements, consider VPN/tunnel for remote access

**Priority: MEDIUM** 

# **Troubleshooting Guide**

Problem: "Unable to connect to DirecTV receiver"

**Diagnostic Steps:** 

# 1. Verify Network Connectivity

```bash

# SSH into server

ssh -p 224 ubuntu@24.123.87.42

# Test ping to receiver ping 192.168.5.121

# Test HTTP connectivity

curl http://192.168.5.121:8080

...

#### 1. Check Receiver Status

- Verify DirecTV receiver is powered on
- Confirm receiver is connected to network
- Check receiver's IP address in network settings
- Verify receiver's network LED indicator

#### 2. Validate Configuration

- Confirm IP address is correct in UI
- Verify port number (should be 8080)
- Check receiver is configured for network control
- Ensure receiver firmware is up to date

#### 3. Review Backend Logs

```bash

# Check PM2 logs for DirecTV errors pm2 logs sports-bar-tv | grep DirecTV

```
# Check last 50 lines of error log tail -50 ~/.pm2/logs/sports-bar-tv-error.log
```

#### 1. Test Firewall/Port Access

```
""bash
# Test if port 8080 is accessible
telnet 192.168.5.121 8080

# Or use nc (netcat)
nc -zv 192.168.5.121 8080
```

### 1. Verify Network Routing

```
""bash
# Check routing table
route -n
```

# Trace route to receiver traceroute 192.168.5.121

### Problem: Receiver shows "Connected" but subscription data fails

#### **Possible Causes:**

- Connection test endpoint responds but subscription API doesn't
- Receiver authentication required for subscription data
- API endpoint path incorrect for receiver model
- Receiver doesn't support network subscription queries

### **Solutions:**

- 1. Review DirecTV receiver's network API documentation
- 2. Check if authentication/credentials required
- 3. Verify API endpoint paths for specific receiver model
- 4. Test with DirecTV's official API testing tools

### **Problem: Form submission not saving values**

#### Solution:

- 1. Clear browser cache and reload page
- 2. Check browser console for JavaScript errors
- 3. Verify React state updates in browser DevTools
- 4. Use workaround with native input setters if needed

### Problem: Matrix input channel not routing correctly

### **Diagnostic Steps:**

- 1. Verify matrix input channel number is correct (1-32)
- 2. Check matrix switcher configuration in System Admin
- 3. Test matrix switching directly without DirecTV
- 4. Verify input channel is properly configured in matrix

### **Recommendations for Production Use**

### **Network Configuration**

1. Isolated VLAN: Place DirecTV receivers on dedicated VLAN

- 2. Static IPs: Assign static IP addresses to all receivers
- 3. **DNS Records:** Create DNS entries for receivers (e.g., directv-1.local)
- 4. Port Forwarding: Configure if receivers are on different subnet

### **Monitoring & Maintenance**

- 1. Health Checks: Implement periodic connection health checks (every 5 minutes)
- 2. Status Alerts: Send notifications when receivers go offline
- 3. Log Rotation: Ensure PM2 logs don't fill disk space
- 4. Backup Configuration: Backup receiver configurations daily

### **Testing with Real Hardware**

To properly test and use DirecTV features:

### 1. Acquire Compatible Receiver:

- Genie HD DVR (HR44, HR54)
- HR24 HD DVR
- Or other network-enabled DirecTV receivers

### 2. Network Setup:

- Connect receiver to network
- Assign static IP or create DHCP reservation
- Verify network connectivity from server

### 3. Receiver Configuration:

- Enable network control in receiver settings
- Configure IP address and port
- Test receiver's web interface directly

### 4. Application Testing:

- Add receiver with correct IP and settings
- Test connection functionality
- Verify subscription polling works
- Test matrix routing integration

### **Security Considerations**

- 1. API Access: Secure DirecTV API endpoints if exposed
- 2. Network Segmentation: Isolate receivers from guest networks
- 3. Access Control: Implement authentication for receiver management
- 4. Audit Logging: Log all receiver configuration changes

### Integration with Matrix Switcher

DirecTV receivers integrate seamlessly with the Wolfpack HDMI matrix:

- 1. **Configuration:** Assign receiver to specific matrix input channel
- 2. **Routing:** Route receiver to any TV output via matrix control
- 3. Status: Monitor receiver status alongside matrix outputs
- 4. **Control:** Manage receiver and routing from single interface

### **Example Workflow:**

- 1. Add DirecTV receiver on matrix input channel 5
- 2. Configure receiver as "Sports Bar DirecTV Main"
- 3. Route to TV outputs as needed for sports events

- 4. Monitor connection status and subscriptions
- 5. Verify sports packages include desired channels

### **Future Enhancements**

#### **Planned Features:**

- [ ] Implement periodic health checks with accurate status reporting
- [ ] Add receiver channel control (change channels remotely)
- [ ] Integrate with Sports Guide for auto-tuning
- [ ] Support multiple receiver types (clients, mini-Genies)
- -[] Implement receiver discovery on network
- [ ] Add bulk receiver management
- [ ] Create receiver groups for simultaneous control
- [ ] Implement receiver event scheduling

#### **Under Consideration:**

- Remote recording management
- DVR playlist integration
- Channel favorites sync
- Multi-receiver coordination
- Advanced diagnostic tools

### 8. Remote Control

### **Overview**

Bartender Remote interface for quick TV and audio control.

#### **Features**

- Quick TV source selection
- Matrix status display
- Bar layout visualization
- · Input source shortcuts

# 9. System Admin

### **Overview**

Administrative tools for system management, testing, and maintenance.

### **Features**

### **Wolfpack Configuration**

- Matrix IP address setup
- Connection testing
- Switching tests

### **Matrix Inputs/Outputs**

· Input/output labeling

- Enable/disable configuration
- Schedule participation settings

### **System Logs**

- Application logs
- Error tracking
- · Activity monitoring

### **Backup Management**

- Manual backup creation
- Backup restoration
- Automated backup status

### **TODO Management**

- Task tracking
- Priority management
- Status updates

### **Wolfpack Matrix Testing System**

Last Updated: October 16, 2025

**Status:** V FULLY FUNCTIONAL with TCP Socket Communication

The Wolfpack Matrix Testing System provides comprehensive testing capabilities for the Wolfpack HDMI matrix switcher, including connection testing and switching functionality tests. All tests include verbose logging for debugging and monitoring.

### **Overview**

The testing system is accessible from the **System Admin Hub** under the **Tests** tab. It provides two main test types:

- 1. Connection Test Verifies TCP connectivity to the Wolfpack matrix
- 2. **Switching Test** Tests actual input/output switching commands

### **Key Features**

- **TCP Socket Communication** Uses native TCP sockets (not HTTP)
- Comprehensive Verbose Logging Detailed logs for every operation
- **V** Database Persistence All test results saved to database
- **Real-time Feedback** Live test status in UI
- **Error Handling** Graceful error handling with detailed messages
- Al-Accessible Logs Logs available via PM2 for local Al analysis

### **Test Types**

### 1. Connection Test

Purpose: Verify TCP connectivity to the Wolfpack matrix switcher

#### **How it Works:**

- 1. Loads active matrix configuration from database
- 2. Establishes TCP socket connection to configured IP:Port
- 3. Tests connection with 5-second timeout
- 4. Logs result to database and PM2 logs
- 5. Returns success/failure status to UI

**API Endpoint:** POST /api/tests/wolfpack/connection

#### **Test Flow:**

```
    Load matrix configuration (IP: 192.168.5.100, Port: 5000)
    Create TCP socket connection
    Wait for connection or timeout (5 seconds)
    Log result to database
    Return status to frontend
```

#### **Success Criteria:**

- TCP connection established within timeout period
- No connection errors

#### Failure Scenarios:

- Connection timeout (5 seconds)
- Connection refused (matrix offline)
- Network unreachable
- Invalid IP/Port configuration

#### 2. Comprehensive Switching Test

Purpose: Test all active input/output combinations on the matrix switcher

#### **How it Works:**

- 1. Loads active matrix configuration with all active inputs and outputs from database
- 2. Tests every combination of active inputs to active outputs
- 3. Sends switching command via TCP for each combination (e.g., "1X33." = Input 1 to Output 33)
- 4. Waits for response with 10-second timeout per test
- 5. Validates each response (looks for "OK" or error messages)
- 6. Logs detailed results for each test to database and PM2 logs
- 7. Provides comprehensive summary with success rate

**API Endpoint:** POST /api/tests/wolfpack/switching

#### **Test Command Format:**

```
{input}X{output}.
Example: 1X33. (Route Input 1 to Output 33)
```

### **Test Scope:**

- Tests ALL active inputs (typically 1-8)
- Tests ALL active outputs (typically 1-8)
- Total tests = Active Inputs × Active Outputs
- Example: 8 inputs × 8 outputs = 64 total tests
- Small delay (100ms) between tests to avoid overwhelming the device

#### **Test Flow:**

```
    Load matrix configuration with active inputs/outputs
    Create test start log
    For each active input:

            Build command: "{input}X{output}."
            Send TCP command with line ending "\r\n"
            Wait for response (up to 10 seconds)
            Parse response for "OK" or error
            Log individual test result to database
             Add 100ms delay before next test

    Calculate summary statistics
    Create test completion log
    Return comprehensive results to frontend
```

#### **Response Format:**

```
"success": true,
  "totalTests": 64,
  "passedTests": 64,
  "failedTests": 0,
  "successRate": "100.0%",
  "duration": 45230,
  "averageDuration": 707,
  "results": [
      "input": 1,
      "inputLabel": "DirecTV 1",
      "output": 1,
      "outputLabel": "TV 1",
      "command": "1X1.",
      "success": true,
      "duration": 650,
      "response": "OK",
      "error": null,
      "testLogId": "clx..."
    },
    // ... more results
  ],
  "summary": "Passed 64/64 tests",
  "testLogId": "clx...",
  "startLogId": "clx..."
}
```

#### **Success Criteria:**

- TCP connection established for each test
- Command sent successfully
- Response received containing "OK"
- No errors in response
- All tests complete successfully

#### **Failure Scenarios:**

- Connection timeout (10 seconds per test)
- Command timeout
- Error response from matrix
- Connection closed without response
- Partial failures (some tests pass, some fail)

#### **UI Display:**

The frontend displays:

- Summary statistics (Total, Passed, Failed, Success Rate, Average Duration)
- Detailed results table showing each input/output combination
- Color-coded status (green for success, red for failure)
- Individual test durations
- Error messages for failed tests
- Scrollable results for large test sets

### **Verbose Logging System**

All Wolfpack tests include comprehensive verbose logging that appears in PM2 logs. This makes it easy for local Al assistants to analyze test results and diagnose issues.

### **Log Format**

```
[WOLFPACK CONNECTION TEST] API endpoint called Timestamp: 2025-10-16T18:45:11.304Z
```

### **Log Levels**

- INFO General operation information (console.log)
- ERROR Error conditions (console.error)
- **SUCCESS** Successful operations (**✓** prefix)
- FAILURE Failed operations (X prefix)

#### **Logged Operations**

### **Connection Test Logs:**

```
[WOLFPACK CONNECTION TEST] API endpoint called
 [WOLFPACK CONNECTION TEST] Loading matrix configuration from database...
[WOLFPACK CONNECTION TEST] Configuration loaded
  Configuration ID: cmgq3koyx000026chpo3jsede
  Name: Graystone Alehouse Wolf Pack Matrix
  IP Address: 192.168.5.100
  TCP Port: 5000
   Protocol: TCP
[WOLFPACK CONNECTION TEST] Testing TCP connection...
[WOLFPACK CONNECTION TEST] Starting TCP connection test
  Target: 192.168.5.100:5000
  Timeout: 5000ms
  Timestamp: 2025-10-16T18:45:11.310Z

    [WOLFPACK CONNECTION TEST] TCP connection established

  Duration: 45ms
[WOLFPACK CONNECTION TEST] Test completed
  Success: true
  Total Duration: 52ms
[WOLFPACK CONNECTION TEST] Saving test result to database...
[₩OLFPACK CONNECTION TEST] Test result saved
  Test Log ID: cmgtrs6q0000l26b3751u36i9
```

### **Switching Test Logs:**

```
[WOLFPACK SWITCHING TEST] API endpoint called
   [WOLFPACK SWITCHING TEST] Loading matrix configuration from database...
[WOLFPACK SWITCHING TEST] Configuration loaded
[WOLFPACK SWITCHING TEST] Creating test start log...
[WOLFPACK SWITCHING TEST] Test start log created
[WOLFPACK SWITCHING TEST] Starting switching test...
   Test Parameters:
     Input: 1
    Output: 33
     Command: 1X33.
[WOLFPACK SWITCHING] Sending TCP command
  Target: 192.168.5.100:5000
  Command: 1X33.
  Timeout: 30000ms
  Timestamp: 2025-10-16T18:45:15.123Z
[₩OLFPACK SWITCHING] TCP connection established
  Sending command with line ending...
[WOLFPACK SWITCHING] Command sent, waiting for response...
[WOLFPACK SWITCHING] Received data: OK
[WOLFPACK SWITCHING] Command successful
  Response: OK
[WOLFPACK SWITCHING TEST] Switch command completed
  Success: true
  Duration: 234ms
[₩OLFPACK SWITCHING TEST] Saving individual test result...
[WOLFPACK SWITCHING TEST] Individual test result saved
[ [WOLFPACK SWITCHING TEST] All tests completed
  Total Tests: 1
  Successful: 1
  Failed: 0
  Total Duration: 245ms
[WOLFPACK SWITCHING TEST] Saving test completion log...
[WOLFPACK SWITCHING TEST] Test completion log saved
```

### **Accessing Logs**

#### **View Real-time Logs:**

```
pm2 logs sports-bar-tv
```

### Filter for Wolfpack Test Logs:

```
pm2 logs sports-bar-tv | grep "WOLFPACK"
```

### **View Specific Log File:**

```
tail -f ~/.pm2/logs/sports-bar-tv-out.log | grep "WOLFPACK"
```

### **Search for Errors:**

```
pm2 logs sports-bar-tv | grep "WOLFPACK" | grep "X"
```

#### **Export Logs for Analysis:**

```
pm2 logs sports-bar-tv --lines 1000 --nostream | grep "WOLFPACK" >
wolfpack_test_logs.txt
```

### **Database Schema**

#### **TestLog Table**

All test results are stored in the TestLog table:

```
model TestLog {
   id
                                String
  @id @default(cuid())
                                String // 'wolfpack_connection' or 'wolfpack_switching'
String // Human-readable test name
String // 'success', 'failed', 'error', 'running'
   testType
   testName
   status
   inputChannel Int? // Input channel number (for switching tests)
outputChannel Int? // Output channel number (for switching tests)
command String? // TCP command sent (e.g., "1X33.")
response String? // Response received from matrix
errorMessage String? // Error message if test failed
duration Int // Test duration in milliseconds
                                duration
   timestamp
                                DateTime @default(now())
   metadata
                                String? // JSON metadata (config details, etc.)
}
```

### **MatrixConfiguration Table**

Matrix configuration used by tests:

```
model MatrixConfiguration {
 id
                   String
                            @id @default(cuid())
  name
                   String
  ipAddress
                   String
                  Int
  tcpPort
                   Int     @default(5000)
Int     @default(4000)
String     @default("TCP")
Boolean     @default(true)
                            @default(5000)
  udpPort
  protocol
  isActive
  cecInputChannel Int?
  updatedAt
                   DateTime @updatedAt
}
```

### **API Endpoints**

POST /api/tests/wolfpack/connection

Test TCP connectivity to Wolfpack matrix.

Request: No body required

Response (Success):

```
{
    "success": true,
    "message": "Successfully connected to Wolfpack matrix at 192.168.5.100:5000",
    "testLogId": "cmgtrs6q0000126b3751u36i9",
    "duration": 52,
    "config": {
        "ipAddress": "192.168.5.100",
        "port": 5000,
        "protocol": "TCP"
    }
}
```

#### Response (Failure):

```
{
    "success": false,
    "message": "TCP connection error: Connection refused",
    "testLogId": "cmgtrs6q0000126b3751u36i9",
    "duration": 5008,
    "config": {
        "ipAddress": "192.168.5.100",
        "port": 5000,
        "protocol": "TCP"
    }
}
```

### POST /api/tests/wolfpack/switching

Test matrix switching functionality.

Request: No body required

### Response (Success):

### Response (Failure):

### **GET** /api/tests/logs

Retrieve test logs from database.

### **Query Parameters:**

- limit (optional) Number of logs to return (default: 200)
- testType (optional) Filter by test type
- status (optional) Filter by status

#### Response:

### **DELETE** /api/tests/logs

Clear all test logs from database.

### **Response:**

```
{
   "success": true,
   "message": "All test logs cleared successfully"
}
```

### **Troubleshooting**

#### **Connection Test Fails**

Symptom: Connection test shows "Connection timeout" or "Connection refused"

### **Diagnostic Steps:**

### 1. Verify Matrix Configuration:

```
bash
    sqlite3 /home/ubuntu/sports-bar-data/production.db "SELECT * FROM MatrixConfiguration
WHERE isActive = 1;"
```

### 2. Test Network Connectivity:

```
bash
  ping 192.168.5.100
  telnet 192.168.5.100 5000
```

#### 3. Check PM2 Logs:

```
bash

pm2 logs sports-bar-tv | grep "WOLFPACK CONNECTION TEST"
```

### 4. Verify Matrix is Powered On:

- Check physical matrix switcher
- Verify network cable connected
- Check matrix status LEDs

### **Common Causes:**

- Matrix switcher is powered off
- Incorrect IP address in configuration
- Network connectivity issues
- Firewall blocking port 5000
- Matrix on different subnet/VLAN

### **Switching Test Fails**

Symptom: Switching test shows "Command timeout" or error response

### **Diagnostic Steps:**

#### 1. Run Connection Test First:

- Verify basic connectivity works
- Connection test must pass before switching test

#### 2. Check Command Format:

```
bash
   pm2 logs sports-bar-tv | grep "Command:"
- Should see: "Command: 1X33."
- Format: {input}X{output}.
```

### 3. Verify Matrix Response:

```
bash
  pm2 logs sports-bar-tv | grep "Received data"
- Should see: "Received data: OK"
- Or error message from matrix
```

#### 4. Test Manually via Telnet:

bash

telnet 192.168.5.100 5000

# Type: 1X33.
# Press Enter
# Should see: 0K

#### **Common Causes:**

- Matrix not responding to commands
- Incorrect command format
- Matrix firmware issue
- Input/output numbers out of range
- Matrix in locked/protected mode

### **No Logs Appearing**

**Symptom:** Tests run but no logs visible in PM2

#### **Diagnostic Steps:**

#### 1. Check PM2 Status:

```
bash
  pm2 status sports-bar-tv
```

#### 2. Restart PM2:

```
bash

pm2 restart sports-bar-tv
```

### 3. Check Log Files Directly:

```
tail -f ~/.pm2/logs/sports-bar-tv-out.log
tail -f ~/.pm2/logs/sports-bar-tv-error.log
```

### 4. Verify Logging Not Disabled:

- Check for console.log statements in code
- Verify PM2 log rotation not blocking output

#### **Best Practices**

#### 1. Run Connection Test First

- Always verify connectivity before running switching tests
- Connection test is faster and identifies basic issues

### 2. Monitor PM2 Logs During Tests

- Open PM2 logs in separate terminal
- Watch for detailed error messages
- Helps diagnose issues in real-time

### 3. Check Database Logs

- All tests saved to database
- Use Test Logs tab in UI to review history
- Export logs for analysis if needed

#### 4. Regular Testing

- Run tests after configuration changes

- Test after matrix power cycles
- Verify connectivity after network changes

### 5. Use Verbose Logs for Debugging

- PM2 logs contain detailed information
- Share logs with support if issues persist
- Local AI can analyze logs for patterns

### **Integration with Local AI**

The verbose logging system is designed to be easily readable by local Al assistants (like Ollama). Al can:

### 1. Analyze Test Results:

```
bash
```

```
pm2 logs sports-bar-tv --lines 500 | grep "WOLFPACK"
```

### 2. Identify Patterns:

- Detect recurring failures
- Identify timing issues
- Spot configuration problems

### 3. Suggest Solutions:

- Based on error messages
- Historical test data
- Known issue patterns

### 4. Generate Reports:

- Test success rates
- Performance metrics
- Failure analysis

#### **Future Enhancements**

#### **Planned Features:**

- [ ] Multi-input/output switching tests
- -[] Automated test scheduling
- [ ] Test result notifications
- [ ] Performance benchmarking
- [ ] Matrix health monitoring
- -[] Advanced diagnostics
- -[] Test result visualization
- [ ] Al-powered failure prediction

# Wolfpack Integration (Legacy)

### **TODO Management**

The TODO management system provides task tracking and project management capabilities. The system automatically maintains a TODO\_LIST.md file that reflects the current state of all tasks in the database.

### Important: TODO LIST.md is Auto-Generated

### DO NOT EDIT TODO\_LIST.md MANUALLY

The TODO LIST.md file is automatically generated and updated by the TODO management system. Any manual changes will be overwritten when the system syncs. Always use the TODO API to add, update, or delete tasks.

The auto-generation happens:

- When a TODO is created via the API
- When a TODO is updated via the API
- When a TODO is deleted via the API
- During periodic system syncs

#### **Database Schema**

```
model Todo {
                               @id @default(cuid())
 id
                 String
 title
                 String
 description
                 String?
                               @default("MEDIUM") // "LOW", "MEDIUM", "HIGH", "CRIT-
 priority
                 String
ICAL"
                               @default("PLANNED") // "PLANNED", "IN PROGRESS", "TEST
  status
                 String
ING", "COMPLETE"
 category
                 String?
                 String?
                               // JSON array of tags
 tags
  createdAt
                 DateTime
                               @default(now())
                 DateTime
  updatedAt
                               @updatedAt
  completedAt
                 DateTime?
                 TodoDocument[]
  documents
model TodoDocument {
                         @id @default(cuid())
 id
                 String
  todoId
                 String
  filename
                String
 filepath
                 String
  filesize
                 Int?
  mimetype
                 String?
 uploadedAt
                 DateTime @default(now())
  todo
                 Todo
                          @relation(fields: [todoId], references: [id], onDelete: Cas
cade)
  @@index([todoId])
}
```

### **API Endpoints**

```
GET /api/todos - List all TODOs
```

Retrieve all TODOs with optional filtering.

### **Query Parameters:**

```
- status (optional) - Filter by status: PLANNED , IN PROGRESS , TESTING , COMPLETE
```

- priority (optional) Filter by priority: LOW , MEDIUM , HIGH , CRITICAL
- category (optional) Filter by category string

#### Response:

```
"success": true,
  "data": [
     "id": "cmgki7fkg0001vsfg6ghz142f",
      "title": "Fix critical bug",
      "description": "Detailed description...",
      "priority": "CRITICAL",
      "status": "PLANNED",
      "category": "Bug Fix",
      "tags": "[\"ai-hub\", \"database\"]",
      "createdAt": "2025-10-10T07:07:10.000Z",
      "updatedAt": "2025-10-10T07:07:10.000Z",
      "completedAt": null,
      "documents": []
    }
 ]
}
```

### **Example cURL:**

```
# Get all TODOs
curl http://localhost:3000/api/todos

# Get only high priority TODOs
curl http://localhost:3000/api/todos?priority=HIGH

# Get in-progress tasks
curl http://localhost:3000/api/todos?status=IN_PROGRESS
```

### POST /api/todos - Create new TODO

Add a new TODO item to the system. The TODO LIST.md file will be automatically updated.

#### **Request Body:**

```
"title": "Task title (required)",
  "description": "Detailed task description (optional)",
  "priority": "MEDIUM",
  "status": "PLANNED",
  "category": "Category name (optional)",
  "tags": ["tag1", "tag2"]
}
```

### **Priority Levels:**

- LOW Minor tasks, nice-to-have features
- MEDIUM Standard priority (default)
- HIGH Important tasks requiring attention
- CRITICAL Urgent tasks blocking functionality

#### **Status Values:**

- PLANNED Task is planned but not started (default)
- IN\_PROGRESS Currently being worked on
- TESTING Implementation complete, being tested
- COMPLETE Task finished and verified

#### Response:

```
"success": true,
"data": {
    "id": "cmgki7fkg0001vsfg6ghz142f",
    "title": "Task title",
    "description": "Detailed task description",
    "priority": "MEDIUM",
    "status": "PLANNED",
    "category": "Category name",
    "tags": "[\"tag1\", \"tag2\"]",
    "createdAt": "2025-10-15T03:00:00.000Z",
    "updatedAt": "2025-10-15T03:00:00.000Z",
    "completedAt": null,
    "documents": []
}
```

### **Example API Calls with Different Priority Levels:**

### 1. Create a LOW priority task:

```
curl -X POST http://localhost:3000/api/todos \
  -H "Content-Type: application/json" \
  -d '{
    "title": "Update documentation styling",
    "description": "Improve markdown formatting in README files",
    "priority": "LOW",
    "status": "PLANNED",
    "category": "Enhancement",
    "tags": ["documentation", "style"]
}'
```

### 2. Create a MEDIUM priority task (default):

```
curl -X POST http://localhost:3000/api/todos \
  -H "Content-Type: application/json" \
  -d '{
    "title": "Add unit tests for TODO API",
    "description": "Create comprehensive test suite for TODO endpoints",
    "priority": "MEDIUM",
    "category": "Testing & QA",
    "tags": ["testing", "api"]
}'
```

#### 3. Create a HIGH priority task:

```
curl -X POST http://localhost:3000/api/todos \
   -H "Content-Type: application/json" \
   -d '{
      "title": "Optimize database queries",
      "description": "Profile and optimize slow database queries affecting performance",
      "priority": "HIGH",
      "status": "PLANNED",
      "category": "Performance",
      "tags": ["database", "optimization", "high-priority"]
}'
```

#### 4. Create a CRITICAL priority task:

```
curl -X POST http://localhost:3000/api/todos \
   -H "Content-Type: application/json" \
   -d '{
      "title": "CRITICAL: Fix authentication bypass vulnerability",
      "description": "Security vulnerability discovered in authentication flow allowing unauthorized access",
      "priority": "CRITICAL",
      "status": "IN_PROGRESS",
      "category": "Security",
      "tags": ["security", "critical", "urgent", "blocking"]
}'
```

#### JavaScript/TypeScript Example:

```
// Using fetch API
async function createTodo(todoData: {
 title: string;
 description?: string;
 priority?: 'LOW' | 'MEDIUM' | 'HIGH' | 'CRITICAL';
 status?: 'PLANNED' | 'IN PROGRESS' | 'TESTING' | 'COMPLETE';
  category?: string;
 tags?: string[];
}) {
  const response = await fetch('/api/todos', {
    method: 'POST',
    headers: {
      'Content-Type': 'application/json',
    body: JSON.stringify(todoData),
 });
  const result = await response.json();
  return result;
// Example usage
const newTodo = await createTodo({
 title: 'Implement feature X',
 description: 'Add new feature to the system',
 priority: 'HIGH',
category: 'Feature',
 tags: ['frontend', 'ui']
});
```

### PUT /api/todos/[id] - Update TODO

Update an existing TODO item.

Request Body: Same as POST (all fields optional except those you want to update)

#### **Example cURL:**

```
curl -X PUT http://localhost:3000/api/todos/cmgki7fkg0001vsfg6ghz142f \
  -H "Content-Type: application/json" \
  -d '{
    "status": "IN_PROGRESS",
    "priority": "HIGH"
}'
```

#### DELETE /api/todos/[id] - Delete TODO

Remove a TODO item from the system.

#### **Example cURL:**

```
curl -X DELETE http://localhost:3000/api/todos/cmgki7fkg0001vsfg6ghz142f
```

### POST /api/todos/[id]/complete - Mark TODO as complete

Mark a TODO as complete and set the completion timestamp.

#### **Example cURL:**

```
curl -X POST http://localhost:3000/api/todos/cmgki7fkg0001vsfg6ghz142f/complete
```

### **Authentication & Authorization**

Current Status: No authentication required

The TODO API currently does not require authentication or authorization. All endpoints are publicly accessible on the local network. This is suitable for internal use within a trusted network environment.

### **Security Considerations:**

- API is accessible to anyone on the same network
- Suitable for internal sports bar management systems
- For production internet-facing deployments, consider adding:
- JWT-based authentication
- Role-based access control (RBAC)
- API rate limiting
- IP whitelisting

#### **GitHub Synchronization**

The TODO system automatically synchronizes with GitHub:

- When a TODO is created, updated, or deleted, the TODO LIST.md file is automatically regenerated
- Changes are committed to the repository with descriptive commit messages
- Synchronization happens in the background without blocking API responses
- If GitHub sync fails, the operation still succeeds locally (sync errors are logged)

#### **Sync Commit Messages:**

- Create: chore: Add TODO - [Task Title]

```
- Update: chore: Update TODO - [Task Title]- Delete: chore: Remove TODO - [Task Title]
```

#### **Best Practices**

- 1. Always use the API Never edit TODO LIST.md directly
- 2. Use descriptive titles Make tasks easy to understand at a glance
- 3. Add detailed descriptions Include steps, affected components, and expected outcomes
- 4. Tag appropriately Use consistent tags for filtering and organization
- 5. Set correct priority Use CRITICAL sparingly for true blocking issues
- 6. Update status regularly Keep task status current as work progresses
- 7. **Complete tasks** Use the complete endpoint to properly timestamp completion

# **Backup & Maintenance**

### **Automated Daily Backup**

**Schedule:** Daily at 3:00 AM (server time)

Script: /home/ubuntu/github\_repos/Sports-Bar-TV-Controller/backup\_script.js
Backup Directory: /home/ubuntu/github\_repos/Sports-Bar-TV-Controller/backups/

Retention: 14 days

### **Cron Job:**

```
0 3 * * * cd /home/ubuntu/github_repos/Sports-Bar-TV-Controller && /usr/bin/node backup_script.js >> backup.log 2>&1
```

### What Gets Backed Up:

- 1. Matrix configuration (JSON format)
- 2. Database files ( prisma/data/sports\_bar.db )
- 3. Atlas configurations

**Backup File Format:** backup\_YYYY-MM-DD\_HH-MM-SS.json

### **Manual Backup**

#### Database:

```
pg_dump sports_bar_tv > backup_$(date +%Y%m%d_%H%M%S).sql
```

### **Application:**

```
tar -czf \ sports-bar-backup-\$(date \ +\%Y\%m\%d).tar.gz \ \sim/github\_repos/Sports-Bar-TV-Controller
```

### Restore from Backup

#### **Database:**

```
psql sports_bar_tv < backup_20251015_020000.sql
```

#### **Atlas Configuration:**

```
cd ~/github_repos/Sports-Bar-TV-Controller/data/atlas-configs
cp cmgjxa5ai000260a7xuiepjl_backup_TIMESTAMP.json cmgjxa5ai000260a7xuiepjl.json
```

# **Troubleshooting**

### **Application Issues**

### **Application Won't Start:**

```
# Check PM2 status
pm2 status

# View logs
pm2 logs sports-bar-tv

# Restart application
pm2 restart sports-bar-tv
```

#### **Database Connection Errors:**

```
# Check database status
npx prisma db pull

# Run pending migrations
npx prisma migrate deploy

# Regenerate Prisma client
npx prisma generate
```

### **Network Issues**

### Wolfpack Matrix Not Responding:

- Check network connectivity: ping <wolfpack-ip>
- 2. Verify matrix is powered on
- 3. Check network cable connections
- 4. Confirm same network/VLAN
- 5. Test connection in System Admin

#### **Atlas Processor Offline:**

- 1. Check connectivity: ping 192.168.5.101
- 2. Verify processor is powered on
- 3. Check configuration file exists
- 4. Restore from backup if needed

### **Performance Issues**

### **Slow Response Times:**

- 1. Check PM2 resource usage: pm2 monit
- 2. Review application logs

- 3. Check database size and optimize
- 4. Restart application if needed

### **High Memory Usage:**

- 1. Check PM2 status: pm2 status
- 2. Restart application: pm2 restart sports-bar-tv
- 3. Monitor logs for memory leaks

# **Security Best Practices**

### **Network Security**

- · Wolfpack matrix on isolated VLAN
- · Application behind firewall
- Use HTTPS in production (configure reverse proxy)

### **Authentication**

- Strong passwords for all accounts
- Regular password rotation
- Secure storage of credentials

### **API Security**

- API keys in .env file only
- Never commit .env to repository
- Masked display in UI
- Server-side validation

### **Database Security**

- Strong database passwords
- Restrict access to localhost
- · Regular security updates
- Encrypted backups

# **Recent Changes**

# October 15, 2025 - DirecTV Integration Documentation Update

**Status:** V Documentation complete

**Updated By:** DeepAgent

### **Documentation Added**

- ✓ Comprehensive DirecTV Integration section (Section 7)
- Complete testing results from October 15, 2025 testing session
- Detailed error messages and diagnostics
- Verbose logging implementation details
- API endpoint specifications with request/response examples
- Database schema for DirecTVReceiver model

- <a> Known issues and limitations documentation</a>
- Comprehensive troubleshooting guide
- V Production deployment recommendations
- V Network configuration guidelines
- Security considerations
- V Future enhancement roadmap

### **Testing Results Documented**

#### **Successful Operations:**

- Receiver creation with full configuration
- Receiver deletion (tested with 9 receivers)
- Form validation and React integration
- Matrix input channel selection (32 channels)

#### **Known Issues:**

- Subscription polling requires physical DirecTV hardware
- Connection status ambiguity in UI
- Form input React state synchronization workaround needed
- Network topology dependencies

### **Logging Details Added**

- PM2 log locations and access methods
- Logged operations for all DirecTV activities
- · Example log outputs for debugging
- Log search commands for troubleshooting

### **Troubleshooting Guide Includes**

- Network connectivity verification steps
- Receiver status checking procedures
- Configuration validation methods
- Backend log review commands
- Firewall/port testing procedures
- Common problems and solutions

# October 15, 2025 - PR #193: Unified Prisma Client & Al Hub Fixes (MERGED TO MAIN)

Status: V Successfully merged, tested, and deployed

### **Changes Implemented**

### 1. Prisma Client Singleton Pattern

- V Unified all Prisma client imports across 9 API route files to use singleton from @/lib/db
- Prevents multiple Prisma client instances and potential memory leaks
- Improves database connection management
- V Standardizes database access patterns throughout the application

### 2. Al Hub Database Models

- Added IndexedFile model for tracking indexed codebase files
- Added QAEntry model (renamed from QAPair) for Q&A training data

- Added TrainingDocument model for Al Hub training documents
- Added ApiKey model for managing Al provider API keys
- V Successfully migrated database with new schema

#### 3. Logging Enhancements

- Added comprehensive verbose logging to Al system components:
  - Codebase indexing process with file counts and progress
  - Vector embeddings generation and storage
  - Q&A entry creation with detailed field logging
  - Q&A entry retrieval with guery debugging
  - Database operations with success/failure tracking

### 4. Bug Fixes

- V Fixed Q&A entries GET handler that was incorrectly processing requests as POST
- Corrected async/await patterns in Q&A API routes
- Improved error handling with detailed error messages

### Testing Results (Remote Server: 24.123.87.42:3000)

All features successfully tested on production server:

- Codebase Indexing: 720 files successfully indexed
- **Q&A Entry Creation:** Successfully created test entries with proper field mapping
- V Q&A Entry Retrieval: GET requests now working correctly, returns all entries
- Verbose Logging: Confirmed in PM2 logs with detailed debugging information
- V Database Integrity: All migrations applied successfully, schema validated

#### Files Modified in PR #193

- src/app/api/ai-assistant/index-codebase/route.ts Added verbose logging & unified Prisma
- src/app/api/ai-assistant/search-code/route.ts Unified Prisma client import
- src/app/api/ai/qa-entries/route.ts Fixed GET handler bug & added logging
- src/app/api/cec/discovery/route.ts Unified Prisma client import
- src/app/api/home-teams/route.ts Unified Prisma client import
- src/app/api/schedules/[id]/route.ts Unified Prisma client import
- src/app/api/schedules/execute/route.ts Unified Prisma client import
- src/app/api/schedules/logs/route.ts Unified Prisma client import
- src/app/api/schedules/route.ts Unified Prisma client import
- prisma/schema.prisma Added new Al Hub models
- All backup files removed for clean codebase

#### Related Pull Requests

- **PR #193** Successfully merged to main branch (supersedes PR #169)
- X PR #169 Closed due to merge conflicts (superseded by PR #193)

#### **Benefits Achieved**

- Eliminated Prisma client instance conflicts
- Improved AI Hub reliability and debuggability
- Enhanced production monitoring with verbose logging
- Fixed critical Q&A entry retrieval bug
- Clean, maintainable codebase with consistent patterns

### October 15, 2025 - Al Hub Testing & Documentation Update

- Comprehensive AI Hub testing completed
- V Identified 2 critical errors requiring immediate fixes
- Created detailed testing report
- Reorganized documentation by site tabs
- V Updated port from 3001 to 3000
- 🗸 Added detailed AI Hub section with status and fix plans

### October 14, 2025 - Al Hub Database Models

- 🗸 Added missing database models (IndexedFile, QAPair, TrainingDocument, ApiKey)
- V Fixed AI Hub API routes
- Verified basic AI Hub functionality

### October 10, 2025 - Atlas Configuration Restoration

- V Fixed critical Atlas configuration wipe bug
- Restored Atlas configuration from backup
- V Fixed dynamic zone labels
- V Implemented matrix label updates
- V Fixed matrix test database errors

### October 9, 2025 - Outputs Configuration & Backup System

- Configured outputs 1-4 as full matrix outputs
- <a>Implemented automated daily backup system</a>
- Added 14-day retention policy

# **Support Resources**

### **Documentation Links**

- Next.js: https://nextjs.org/docs
- Prisma: https://www.prisma.io/docs
- Tailwind CSS: https://tailwindcss.com/docs

### **Project Resources**

- GitHub Repository: https://github.com/dfultonthebar/Sports-Bar-TV-Controller
- GitHub Issues: https://github.com/dfultonthebar/Sports-Bar-TV-Controller/issues
- Al Hub Testing Report: /home/ubuntu/ai hub testing report.md

### **Getting Help**

- 1. Check this documentation
- 2. Review application logs: pm2 logs sports-bar-tv
- 3. Check GitHub issues
- 4. Create new issue with detailed information

Last Updated: October 15, 2025 by DeepAgent

Version: 2.2

Status: Production Ready (Al Hub has 2 critical issues requiring fixes)

## **Recent Deployments**

### PR #193 - Prisma Client Singleton Pattern Fix (October 15, 2025)

Deployment Date: October 15, 2025

Deployed By: DeepAgent

Commit: f51616d - "Fix: Unify Prisma Client Singleton Pattern (#193)"

#### **Changes:**

- Unified Prisma Client singleton pattern across the application

- Fixed database connection handling issues
- Improved application stability and performance

### **Deployment Steps Executed:**

- 1. SSH connection established to production server (24.123.87.42:224)
- 2. Navigated to /home/ubuntu/Sports-Bar-TV-Controller
- 3. Pulled latest changes from main branch (already up to date)
- 4. Ran npm install (dependencies up to date)
- 5. Generated Prisma Client with npx prisma generate
- 6. Built application with npm run build (completed successfully)
- 7. Restarted PM2 process sports-bar-tv

### **Verification:**

- PM2 process status: Online ✓
- Application startup: Successful (Ready in 496ms) ✓
- Memory usage: 57.0mb (healthy) ✓
- CPU usage: 0% (stable) ✓
- Uptime: Stable with no crashes ✓

#### **Documentation Updates:**

- Corrected production server path to /home/ubuntu/Sports-Bar-TV-Controller
- Updated PM2 process name to sports-bar-tv (was incorrectly documented as sports-bar-tv-controller)
- Added npx prisma generate step to deployment procedure
- Clarified distinction between development and production paths

# 10. Amazon Fire TV Integration

### **Overview**

The Sports Bar TV Controller includes comprehensive integration with Amazon Fire TV devices for remote control, automation, and matrix routing. The system uses Android Debug Bridge (ADB) for network-based control of Fire TV devices, enabling automated content selection, app launching, and coordination with the Wolfpack HDMI matrix switcher.

### **Current Production Configuration:**

- Fire TV Model: Fire TV Cube (3rd Gen - AFTGAZL)

- IP Address: 192.168.5.131- Port: 5555 (ADB default)- Matrix Input: Channel 13

- Connection Status: Fully operational - ADB Status: Enabled and connected

### Fire TV Cube Specifications

#### Hardware:

- Model: AFTGAZL (Amazon Fire TV Cube, 3rd Generation - 2022)

- Processor: Octa-core ARM-based processor

- RAM: 2GB - Storage: 16GB

- Operating System: Fire OS 7+ (Based on Android 9)

- Network: Wi-Fi 6, Gigabit Ethernet port

- Ports: HDMI 2.1 output, Micro USB, Ethernet, IR extender

#### Capabilities:

- 4K Ultra HD, HDR, HDR10+, Dolby Vision
- Dolby Atmos audio
- Hands-free Alexa voice control
- Built-in speaker for Alexa
- IR blaster for TV control
- HDMI-CEC support

### **ADB Bridge Configuration**

### **Server Configuration:**

- ADB Path: /usr/bin/adb

- ADB Version: 1.0.41 (Version 28.0.2-debian)

Installation Location: /usr/lib/android-sdk/platform-tools/adb
 Connection Status: Active and connected to 192.168.5.131:5555

- **Device State:** "device" (fully operational)

- Setup Date: October 16, 2025

### **Connection Management:**

```
# Connect to Fire TV Cube
adb connect 192.168.5.131:5555

# Check connection status
adb devices
# Expected output:
# List of devices attached
# 192.168.5.131:5555 device

# Test device communication
adb -s 192.168.5.131:5555 shell getprop ro.product.model
# Expected output: AFTGAZL

# Disconnect (if needed)
adb disconnect 192.168.5.131:5555
```

### **Enabling ADB on Fire TV**

### **Step-by-Step Process:**

### 1. Enable Developer Options:

- Go to Settings → My Fire TV → About
- Click on device name 7 times rapidly
- "Developer Options" will appear in Settings

### 2. Enable ADB Debugging:

- Go to Settings → My Fire TV → Developer Options
- Turn on "ADB Debugging"
- Confirm warning dialog

#### 3. First Connection Authorization:

- First ADB connection shows authorization prompt on TV
- Select "Always allow from this computer"
- Tap OK to authorize

### **Matrix Integration**

#### **Physical Connection:**

- Fire TV Cube HDMI output → Wolfpack Matrix Input 13
- Matrix can route Input 13 to any of 32 TV outputs

### **Routing Control:**

### Benefits:

- Unified control of Fire TV content routing
- Show same Fire TV content on multiple displays
- Quick switching between Fire TV and other sources
- Coordinate Fire TV control with matrix routing

### **API Endpoints**

### **Device Management**

### **GET** /api/firetv-devices

- Retrieve all configured Fire TV devices
- Returns array of device objects with status

### POST /api/firetv-devices

- Add new Fire TV device

- Requires: name, ipAddress, port, deviceType
- Optional: inputChannel (matrix input)
- Validates IP format and prevents duplicates

### PUT /api/firetv-devices

- Update existing Fire TV device configuration
- Can modify all fields except device ID

### **DELETE** /api/firetv-devices?id={deviceId}

- Remove Fire TV device from system
- Device can be re-added anytime

### **Remote Control**

### POST /api/firetv-devices/send-command

Send remote control command to Fire TV:

```
{
  "deviceId": "device_id",
  "ipAddress": "192.168.5.131",
  "port": 5555,
  "command": "HOME"
}
```

#### **Supported Commands:**

- Navigation: UP, DOWN, LEFT, RIGHT, OK, BACK, HOME, MENU
- Media: PLAY\_PAUSE, PLAY, PAUSE, REWIND, FAST\_FORWARD
- Volume: VOL UP, VOL DOWN, MUTE
- Power: SLEEP, WAKEUP

#### App Launch:

```
{
  "deviceId": "device_id",
  "ipAddress": "192.168.5.131",
  "port": 5555,
  "appPackage": "com.espn.score_center"
}
```

### **Connection Testing**

### POST /api/firetv-devices/test-connection

Test connectivity to Fire TV device:

```
{
    "ipAddress": "192.168.5.131",
    "port": 5555,
    "deviceId": "device_id"
}
```

#### **Success Response:**

```
"success": true,
"message": "Fire TV device connected via ADB",
"deviceInfo": {
    "model": "AFTGAZL",
    "version": "Fire OS 7.6.6.8"
}
```

### **Subscription Polling**

### POST /api/firetv-devices/subscriptions/poll

Retrieve device status and installed apps:

```
{
  "deviceId": "device_id",
  "ipAddress": "192.168.5.131",
  "port": 5555
}
```

### **Remote Control Commands**

### **Navigation Commands:**

```
# D-Pad Navigation
   # 19
adb -s 192.168.5.131:5555 shell input keyevent KEYCODE DPAD UP
   # 20
adb -s 192.168.5.131:5555 shell input keyevent KEYCODE DPAD DOWN
adb -s 192.168.5.131:5555 shell input keyevent KEYCODE DPAD LEFT
   # 21
adb -s 192.168.5.131:5555 shell input keyevent KEYCODE_DPAD_RIGHT
   # 22
adb -s 192.168.5.131:5555 shell input keyevent KEYCODE DPAD CENTER # 23 (OK/Select)
# System Navigation
adb -s 192.168.5.131:5555 shell input keyevent KEYCODE_HOME
   # 3
   # 4
adb -s 192.168.5.131:5555 shell input keyevent KEYCODE_BACK
   # 82
adb -s 192.168.5.131:5555 shell input keyevent KEYCODE_MENU
```

#### **Media Controls:**

```
adb -s 192.168.5.131:5555 shell input keyevent KEYCODE_MEDIA_PLAY_PAUSE # 85 adb -s 192.168.5.131:5555 shell input keyevent KEYCODE_MEDIA_PLAY # 126 adb -s 192.168.5.131:5555 shell input keyevent KEYCODE_MEDIA_PAUSE # 127 adb -s 192.168.5.131:5555 shell input keyevent KEYCODE_MEDIA_REWIND # 89 adb -s 192.168.5.131:5555 shell input keyevent KEYCODE_MEDIA_FAST_FORWARD # 90
```

#### **Volume Controls:**

```
adb -s 192.168.5.131:5555 shell input keyevent KEYCODE_VOLUME_UP # 24 adb -s 192.168.5.131:5555 shell input keyevent KEYCODE_VOLUME_DOWN # 25 adb -s 192.168.5.131:5555 shell input keyevent KEYCODE_VOLUME_MUTE # 164
```

## **Streaming Apps Configuration**

### **Sports Streaming Apps:**

```
- ESPN - com.espn.score_center
```

```
- FOX Sports - com.fox.now
```

```
- NBC Sports - com.nbc.nbcsports.liveextra
- Paramount+ (CBS Sports) - com.cbs.ott
- YouTube TV - com.google.android.youtube.tv

League-Specific Apps:
- NFL+ - com.nflmobile.nflnow
- NFL Game Pass - com.nfl.gamepass
- NBA League Pass - com.nba.game
- MLB.TV - com.bamnetworks.mobile.android.gameday.mlb
- NHL.TV - com.nhl.gc1112.free
```

### **App Launch Commands:**

```
# Launch ESPN
adb -s 192.168.5.131:5555 shell monkey -p com.espn.score_center 1

# Launch Netflix
adb -s 192.168.5.131:5555 shell monkey -p com.netflix.ninja 1

# Alternative method
adb -s 192.168.5.131:5555 shell am start -n com.espn.score_center/.MainActivity
```

### **Automation Capabilities**

### **Scheduled App Launching:**

```
# Crontab example: Launch ESPN at 7 PM daily
0 19 * * * curl -X POST http://localhost:3000/api/firetv-devices/send-command \
    -H "Content-Type: application/json" \
    -d '{"deviceId":"device_id", "appPackage":"com.espn.score_center"}'
```

### **Coordinated Control:**

```
# Script for game day setup
#!/bin/bash
# 1. Route Fire TV to main bar TVs
curl -X POST http://localhost:3000/api/matrix/route \
    -d '{"input":13,"outputs":[33,34,35]}'

# 2. Launch sports app
curl -X POST http://localhost:3000/api/firetv-devices/send-command \
    -d '{"deviceId":"device_id","appPackage":"com.espn.score_center"}'
```

## **Diagnostic Commands**

#### **Device Information:**

```
# Get device model
adb -s 192.168.5.131:5555 shell getprop ro.product.model
# Output: AFTGAZL

# Get Fire OS version
adb -s 192.168.5.131:5555 shell getprop ro.build.version.release
# Output: 9

# Get all properties
adb -s 192.168.5.131:5555 shell getprop

# Get device uptime
adb -s 192.168.5.131:5555 shell uptime
```

#### **Network Information:**

```
# IP address details
adb -s 192.168.5.131:5555 shell ifconfig wlan0

# Network interfaces
adb -s 192.168.5.131:5555 shell ip addr show
```

#### **Installed Apps:**

```
# List all packages
adb -s 192.168.5.131:5555 shell pm list packages

# User-installed apps only
adb -s 192.168.5.131:5555 shell pm list packages -3

# Search for specific app
adb -s 192.168.5.131:5555 shell pm list packages | grep -i espn
```

### **Current App Status:**

```
# Get currently focused app
adb -s 192.168.5.131:5555 shell dumpsys window | grep mCurrentFocus
# Output: mCurrentFocus=Window{hash u0 package/activity}
```

### **Troubleshooting**

#### **Device Shows Offline:**

### 1. Verify Network Connectivity:

```
bash
ping 192.168.5.131
# Should respond with low latency (< 50ms)</pre>
```

### 2. Check ADB Status on Fire TV:

- Settings → My Fire TV → Developer Options
- Ensure "ADB Debugging" is ON
- May auto-disable after system updates

### 3. Test Port Accessibility:

bash

```
telnet 192.168.5.131 5555
# Or
nc -zv 192.168.5.131 5555
```

#### 4. Restart ADB Server:

```
bash
  adb kill-server
  adb start-server
  adb connect 192.168.5.131:5555
```

#### 5. Restart Fire TV:

- Unplug Fire TV Cube for 30 seconds
- Plug back in, wait for full boot (2 minutes)
- Reconnect ADB

#### **Commands Timeout:**

- 1. Check network latency (should be < 100ms)
- 2. Verify Fire TV not overloaded (close background apps)
- 3. Test with simple command (HOME) first
- 4. Review PM2 logs for specific errors

### **Connection Drops:**

#### 1. Use Static IP:

- Assign static IP to Fire TV: 192.168.5.131
- Or use DHCP reservation based on MAC address

### 2. Improve Network:

- Use Ethernet instead of Wi-Fi (recommended)
- Check for network congestion
- Verify no VLAN isolation

### 3. Keep-Alive Script:

```
bash
# Run every 5 minutes via cron
*/5 * * * * adb -s 192.168.5.131:5555 shell echo "keepalive" > /dev/null
```

### **Health Monitoring**

### **Automated Health Check Script:**

```
#!/bin/bash
# /home/ubuntu/scripts/firetv-health-check.sh

DEVICE_IP="192.168.5.131"
DEVICE_PORT="5555"
LOG="/var/log/firetv-health.log"

# Test connectivity
if ! adb devices | grep "$DEVICE_IP:$DEVICE_PORT" | grep "device" > /dev/null; then
echo "[$(date)] Fire TV offline - reconnecting" >> $LOG
adb connect $DEVICE_IP:$DEVICE_PORT >> $LOG
else
echo "[$(date)] Fire TV online" >> $LOG
fi
```

#### Schedule with cron:

```
# Run every 5 minutes
*/5 * * * * /home/ubuntu/scripts/firetv-health-check.sh
```

### **Monitoring Metrics:**

- Connection status (online/offline)
- Response time (should be < 500ms)
- Command success rate (target > 95%)
- ADB connection stability

### **Data Storage**

### **Configuration File:**

- **Location:** /data/firetv-devices.json
- Format: JSON array of device objects
- Backup: Included in automated daily backups (3:00 AM)
- Backup Location: /backups/ with timestamps

#### **Device Object Structure:**

```
"id": "firetv_timestamp_hash",
    "name": "Fire TV Cube Bar",
    "ipAddress": "192.168.5.131",
    "port": 5555,
    "deviceType": "Fire TV Cube",
    "inputChannel": "13",
    "isOnline": true,
    "adbEnabled": true,
    "addedAt": "2025-10-16T10:30:00.000Z",
    "updatedAt": "2025-10-16T12:00:00.000Z"
}
```

### **Best Practices**

#### **Network Configuration:**

- Use static IP address for Fire TV devices
- Ethernet connection preferred over Wi-Fi

- Ensure low latency (< 50ms) to Fire TV
- No firewall blocking port 5555

#### **Device Management:**

- Keep ADB debugging enabled at all times
- Regular connectivity tests before events
- Monitor for system updates (may disable ADB)
- Restart Fire TV weekly during maintenance

### **Security:**

- Limit access to ADB port (5555) from external networks
- Use network segmentation for streaming devices
- Secure SSH access to controller server
- Monitor unauthorized ADB connection attempts

#### **Performance:**

- Close unused apps regularly
- Clear cache monthly
- Monitor storage space (keep > 2GB free)
- Restart Fire TV during off-hours

### **Integration with Sports Guide**

#### **Automated Content Selection:**

- Sports Guide can trigger Fire TV app launches
- Route Fire TV to appropriate displays based on schedule
- Coordinate multiple Fire TVs for multi-game viewing
- Automatic switching between streaming services

### **Game Day Workflow:**

- 1. Sports Guide identifies upcoming games
- 2. System determines which streaming service has content
- 3. Fire TV launches appropriate app
- 4. Matrix routes Fire TV to designated displays
- 5. Content ready for viewing at game time

### **Documentation References**

### **Comprehensive Documentation:**

- Q&A Sheet: /home/ubuntu/amazon\_firetv\_qa\_sheet.md
- **ADB Bridge Setup:** /home/ubuntu/firetv\_ads\_bridge\_setup.md
- **Testing Report:** /home/ubuntu/firetv\_testing\_findings.md
- Total Q&A Pairs: 95+ covering all aspects

#### **Topics Covered:**

- Device setup and configuration
- ADB bridge installation and setup
- Matrix integration
- API endpoints reference
- Remote control commands
- Troubleshooting procedures
- Best practices for deployment

### **Current Status**

#### **Production Environment:**

- V Fire TV Cube connected and operational (192.168.5.131:5555)
- ADB bridge fully configured and tested
- Matrix integration active (Input 13)
- API endpoints operational
- Remote control commands working
- Form submission bugs fixed (October 15, 2025)
- CSS styling issues resolved
- Comprehensive documentation complete

**Last Updated:** October 16, 2025 **Last Tested:** October 16, 2025 **Status:** Production Ready ✓

# **LATEST UPDATE:** Sports Guide v5.0.0 - October 16, 2025

### **Critical Fix Applied**

Issue: Sports Guide was not loading ANY data from The Rail Media API.

**Root Cause:** Frontend/backend parameter mismatch - frontend sent selectedLeagues , backend expected days/startDate/endDate .

**Solution:** Drastically simplified the entire system:

- REMOVED all league selection UI (800+ lines of code removed)
- ADDED automatic loading of ALL sports on page visit
- **ADDED** maximum verbosity logging for Al analysis
- V FIXED both Sports Guide and Bartender Remote Channel Guide

#### Results

### Sports Guide ( /sports-guide ):

- <a> Auto-loads</a> 7 days of ALL sports programming
- Displays 17+ sports categories
- Shows 361+ games with full details
- No user interaction required
- Simple search and refresh interface

### **Bartender Remote Channel Guide (** /remote → **Guide tab)**:

- V Successfully loads sports data from Rail Media API
- Shows device-specific channel numbers
- ✓ Cable/Satellite/Streaming support
- Watch" button integration

# **Testing Verified**

Test Date: October 16, 2025 at 4:29-4:30 AM

### **Sports Guide Test Results:**

- Loaded 17 sports, 361 games
- MLB Baseball: 18 games
- NBA Basketball: 22 games
- NFL, NHL, College sports, Soccer, and more
- Load time: ~5 seconds

#### **Bartender Remote Test Results:**

- Cable Box 1 guide loaded successfully
- MLB games displayed with channel numbers (FOXD 831, UniMas 806)
- NBA games displayed with channel numbers (ESPN2 28, NBALP)
- Watch buttons functional

### **Architecture Changes (v5.0.0)**

#### **Before:**

#### After:

```
Frontend Auto-load on mount (days: 7)

API Route Fetch from Rail Media API

ALL sports data returned 

Display in both Sports Guide and Bartender Remote
```

### Maximum Verbosity Logging

All API routes now include comprehensive timestamped logging:

- Every API request with full parameters
- Full API responses with data counts
- Error details with stack traces
- Performance timing
- Accessible via pm2 logs sports-bar-tv

#### Files Modified

- 1. /src/app/api/sports-guide/route.ts Simplified auto-loading API
- 2. /src/components/SportsGuide.tsx Removed league UI, added auto-loading
- 3. /src/app/api/channel-guide/route.ts Integrated Rail Media API

### Deployment

```
cd /home/ubuntu/Sports-Bar-TV-Controller
npm run build
pm2 restart sports-bar-tv
```

**Status:** Application successfully rebuilt and restarted.

### **Detailed Report**

See SPORTS\_GUIDE\_FIX\_REPORT.md for complete technical details, testing results, and architecture diagrams.

# **Database Logging and Monitoring**

### Log Files

The system maintains comprehensive logs for all database operations:

- Audit Log: /home/ubuntu/sports-bar-data/audit.log All database operations
- Backup Log: /home/ubuntu/sports-bar-data/backup.log Backup operations
- **Restore Log**: /home/ubuntu/sports-bar-data/restore.log Restore operations
- Monitor Log: /home/ubuntu/sports-bar-data/file-monitor.log File system events
- PM2 Logs: pm2 logs sports-bar-tv Application and Prisma query logs

### Viewing Logs

```
# View all logs summary
/home/ubuntu/sports-bar-data/view-logs.sh

# View specific log
tail -f /home/ubuntu/sports-bar-data/audit.log
```

### **Log Components**

- 1. Prisma Query Logging All SQL queries with parameters and duration
- 2. Database Audit Logger Structured operation logging with user attribution
- 3. Backup Logging Complete backup operation tracking
- 4. Restore Logging Restore operation tracking with safety backups
- 5. File Monitor Real-time database file change monitoring

See docs/DATABASE PROTECTION.md for complete logging documentation.

# Critical Fix: Wolfpack Settings Revert Issue (October 16, 2025)

### **Problem**

User reported that Wolfpack matrix settings were reverting to generic labels (e.g., "Input 1", "Output 1") after clicking save. All custom labels were being lost.

### **Root Cause Analysis**

The issue was NOT caused by the backup/restore system as initially suspected. Investigation revealed:

- 1. **Database File Monitor**: The db-file-monitor PM2 process was only logging changes, not autorestoring
- 2. Backup Scripts: All restore operations were manual-only, no automatic triggers

3. **Actual Culprit**: The API endpoint /api/matrix/config had a bug in the MatrixOutput insertion code

**Specific Bug**: The raw SQL INSERT statement was trying to insert into a non-existent column isMatrixOutput:

```
INSERT INTO MatrixOutput (..., isMatrixOutput) VALUES (..., 1)
```

This caused the database transaction to fail and rollback, reverting all changes including the custom labels.

# **Solution Implemented**

- 1. First Fix: Removed the non-existent isMatrixOutput column from the INSERT statement
- 2. **Second Fix**: Replaced raw SQL approach with Prisma's createMany() method for better maintainability and type safety

Code Changes (in src/app/api/matrix/config/route.ts ):

- Removed raw SQL \$executeRaw approach
- Implemented Prisma createMany() for MatrixOutput insertion
- Properly handles all database fields: id, configId, channelNumber, label, resolution, isActive, status, audioOutput, powerOn, dailyTurnOn, dailyTurnOff, createdAt, updatedAt

### **Testing Results**

- ✓ Successfully saved custom labels: "DirecTV Box 1", "TV Zone 1", etc.
- Settings persist after save (no revert)
- Multiple consecutive saves work correctly
- Database transactions complete successfully
- No errors in PM2 logs

### **Files Modified**

• src/app/api/matrix/config/route.ts - Fixed MatrixOutput insertion logic

#### **Git Branch**

- Branch: fix-wolfpack-save-revert
- Commits:
- d08fb1c: Initial fix removing isMatrixOutput column
- 132c1ab: Final fix using Prisma createMany

### **Backup System Status**

The backup/restore system remains intact and functional:

- Backup Script: /home/ubuntu/sports-bar-data/backup.sh Runs hourly via cron
- **Restore Script**: /home/ubuntu/sports-bar-data/restore.sh Manual only
- File Monitor: db-file-monitor PM2 process Logging only, no auto-restore
- **Backups Location**: /home/ubuntu/sports-bar-data/backups/
- Retention: Last 30 backups kept

### **Manual Restore Instructions**

If database restore is ever needed:

```
# List available backups
ls -lh /home/ubuntu/sports-bar-data/backups/

# Restore from specific backup
/home/ubuntu/sports-bar-data/restore.sh backup_YYYYYMMDD_HHMMSS.db

# Restart application
pm2 restart sports-bar-tv
```

# **Q&A File Tracking System**

### **Overview**

The Q&A file tracking system prevents reprocessing of unchanged files during Q&A generation, significantly improving performance and reducing generation time.

### **How It Works**

- 1. File Hashing: Each processed file's content is hashed using MD5
- 2. **Tracking Database**: ProcessedFile table stores file metadata
- 3. Change Detection: Before processing, system checks if file has changed
- 4. Smart Skipping: Unchanged files are automatically skipped

### **ProcessedFile Schema**

### Fields Explanation

- filePath: Unique path to the processed file
- fileHash: MD5 hash of file content for change detection
- lastProcessed: Timestamp of last processing
- qaCount: Number of Q&As generated from this file
- sourceType: Type of source (repository, documentation, etc.)
- status: Processing status (processed, failed, skipped)

### **Force Regenerate Option**

Users can force regeneration of all files by checking the "Force regenerate" option in the UI. This bypasses file tracking and reprocesses all files regardless of their tracking status.

### **Performance Benefits**

• First Run: Processes all 229 files (~10-15 minutes)

- Subsequent Runs: Only processes new/changed files (~30 seconds 2 minutes)
- Time Saved: Up to 90% reduction in generation time

### File Tracking API

The file tracking is integrated into the Q&A generator service:

```
// Check if file needs processing
const { shouldProcess, reason } = await shouldProcessFile(filePath, forceRegenerate);
// Update tracking after processing
await updateFileTracking(filePath, qaCount, sourceType, status);
```

# **Dashboard Graphs & Statistics**

### **Stats API Endpoint**

Endpoint: GET /api/ai-hub/qa-training/stats

Returns comprehensive statistics for the Q&A training dashboard:

### Dashboard Components

- 1. Total Q&As: Shows total count of Q&A entries
- 2. Active Q&As: Shows count of active entries
- 3. By Category: Distribution of Q&As across categories
- 4. **By Source**: Distribution by source type (manual, auto-generated, imported)

### **Data Aggregation**

Statistics are computed using Prisma's groupBy and count operations:

```
const totalCount = await prisma.qAEntry.count();
const activeCount = await prisma.qAEntry.count({ where: { isActive: true } });
const categoryGroups = await prisma.qAEntry.groupBy({
  by: ['category'],
   _count: { id: true },
});
```

### **Troubleshooting Dashboard Issues**

If graphs show "No data":

- 1. Check if Q&A entries exist in database
- 2. Verify stats API endpoint is accessible
- 3. Check browser console for API errors
- 4. Ensure Prisma client is up to date

# **Recent System Changes**

# PR #206: Critical UI Fixes - Q&A Color Scheme, Matrix Display, Global Cache (October 17, 2025)

**Branch**: fix/ui-color-matrix-display

#### Critical Issues Fixed:

### 1. Q&A Training Page Color Scheme

- Problem: White backgrounds with light text created unreadable interface on dark theme
- **Solution**: Converted all components to use dark theme classes (card-dark, slate colors)
- Impact: Proper contrast and readability throughout Q&A training interface
- **Files Modified**: src/app/ai-hub/qa-training/page.tsx

#### 2. Matrix/Wolfpack Settings Page Display

- Problem: Only showing 1 input and 1 output instead of 36x36 grid
- **Solution**: Fixed loadConfigurations() to properly check for empty arrays vs undefined
- Impact: All 36 inputs and 36 outputs now display correctly
- Files Modified: src/components/MatrixControl.tsx

#### 3. Global Cache Device Page

- Problem: "Error adding device" Missing Prisma schema models
- Solution: Added GlobalCacheDevice and GlobalCachePort models to schema
- Impact: Global Cache device management now fully functional
- Files Modified: prisma/schema.prisma

### **Technical Details:**

```
// Q&A Color Scheme Fix
// Before: className="bg-white text-gray-600"
// After: className="card-dark text-slate-300"
// Matrix Display Fix
const hasInputs = data.inputs && Array.isArray(data.inputs) && data.inputs.length > 0
const hasOutputs = data.outputs && Array.isArray(data.outputs) && data.outputs.length
// Global Cache Schema Addition
model GlobalCacheDevice {
            String
                                @id @default(cuid())
 name String
 ipAddress String
                               @unique
            Int
 port
                                @default(4998)
 model
           String?
 status
           String
                                @default("offline")
 lastSeen DateTime?
ports GlobalCachePort[]
 createdAt DateTime
                                @default(now())
 updatedAt DateTime
                                @updatedAt
```

#### **Deployment Steps:**

```
# Generate Prisma client with new models
npx prisma generate

# Push schema changes to database
npx prisma db push

# Restart application
pm2 restart sports-bar-tv
```

### PR #205: Q&A File Tracking & Dashboard Fixes

#### Changes Made:

- Added ProcessedFile model to Prisma schema
- Implemented file hashing utility for change detection
- Updated Q&A generator with file tracking logic
- Added force regenerate option to UI
- Created stats API endpoint for dashboard
- Fixed dashboard graphs to display data correctly
- Updated documentation with new features

### **Performance Improvements:**

- 90% reduction in Q&A generation time for unchanged files
- Smart file skipping based on content hash
- Parallel processing with concurrency control

### Files Modified:

- prisma/schema.prisma Added ProcessedFile model
- src/lib/utils/file-hash.ts New file hashing utility
- src/lib/services/qa-generator.ts File tracking integration
- src/app/api/ai/qa-generate/route.ts Force regenerate support

- src/app/api/ai-hub/qa-training/stats/route.ts New stats endpoint
- src/app/ai-hub/qa-training/page.tsx UI updates for tracking & stats

### PR #204: Wolfpack Settings Revert Fix

Fixed issue where Wolfpack matrix settings were being reverted after save.

### PR #203: Q&A Prisma Schema Fix

Fixed Prisma schema issues with Q&A entry fields.

### PR #202: Global Cache API Routes

Added API routes for Global Cache device management.

# **Development Guidelines**

### **Working with File Tracking**

When modifying Q&A generation:

- 1. Always update file tracking after processing
- 2. Use shouldProcessFile() to check if processing is needed
- 3. Handle tracking errors gracefully
- 4. Log skipped files for visibility

### **Adding New Statistics**

To add new dashboard statistics:

- 1. Add aggregation query to stats API endpoint
- 2. Update stats interface in frontend
- 3. Add new graph component to dashboard
- 4. Test with various data scenarios

### **Database Migrations**

For schema changes:

```
# Development (recommended)
npx prisma db push

# Production
npx prisma migrate deploy
```

# **Maintenance & Monitoring**

### **File Tracking Maintenance**

- Clear Tracking: Delete ProcessedFile entries to force reprocessing
- Reset Hashes: Update fileHash to trigger reprocessing
- Monitor Status: Check status field for failed files

# **Performance Monitoring**

Monitor these metrics:

- Q&A generation time (should be <2 min for incremental)
- Files skipped vs processed ratio
- Failed file count
- Database query performance

### Logs

Check logs for:

- File tracking operations
- Skipped files
- Generation progress
- API errors