Basketball Scraper Test Results

Date: December 13, 2025

Summary

We implemented the user's suggested fixes and tested both NBA.com and Basketball-Reference scrapers. Unfortunately, both sites are currently blocking automated requests.

Changes Implemented ✅

1. **NBA Scraper Endpoint Updated**
   - Changed from `/leagueleaders` to `/commonallplayers`
   - Updated season parameter from "2023-24" to "2024-25"
   - Modified logic to handle different response structure

2. **Playwright Browsers Installed**
   - Successfully installed Chromium browser (123.0.6312.4)
   - Installed FFMPEG for video processing
   - Browser location: `~/.cache/ms-playwright/`

3. **Basketball-Reference Scraper Enhanced**
   - Enabled Playwright browser automation by default
   - Set `use_browser=True` for anti-detection scraper
   - Added PLAYWRIGHT_BROWSERS_PATH environment variable

Test Results

1. NBA.com API (`stats.nba.com`) ❌

Endpoint Tested: `https://stats.nba.com/stats/commonallplayers`
Parameters:
- LeagueID: "00"
- Season: "2024-25"
- IsOnlyCurrentSeason: "1"

Result: **TIMEOUT / BLOCKED**

Error Messages:

```
ReadTimeout: HTTPSConnectionPool(host='stats.nba.com', port=443): Read timed out.
(read timeout=20)
```

Attempts Made:
- ✅ Updated headers with proper NBA Stats API headers
- ✅ Used rate limiting (3-5 seconds between requests)

- ✅ Tried with session persistence
- ✅ Multiple retry attempts with exponential backoff
- ❌ All attempts resulted in timeout after 20-30 seconds

Analysis:
The NBA Stats API is experiencing one of the following issues:
1. **Server-side rate limiting** - API is throttling our requests
2. **IP-based blocking** - Our IP address may be temporarily blocked
3. **Authentication required** - API may now require additional authentication tokens
4. **API overload** - Stats API may be under heavy load

Recommendation for NBA.com:
- Try scraping at different times of day (off-peak hours)
- Consider using NBA's official API with authentication
- Try from a different IP address or use proxy rotation
- Alternative: Use NBA's public player pages instead of stats API

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2. Basketball-Reference.com ❌

URL Tested: `https://www.basketball-reference.com/leaders/fg3_pct_career.html`

Result: **403 FORBIDDEN**

Error Messages:

```
403 Client Error: Forbidden for url: https://www.basketball-reference.com/leaders/
fg3_pct_career.html
```

Attempts Made:
- ✅ Enhanced HTTP headers with browser-like User-Agent
- ✅ Used rate limiting (3-5 seconds between requests)
- ✅ Enabled browser automation with Playwright
- ✅ 4 retry attempts with exponential backoff
- ❌ All attempts blocked with 403 Forbidden

Analysis:
Basketball-Reference has strong anti-scraping protection:
1. **Cloudflare or similar CDN protection** - Detecting automated requests
2. **JavaScript challenges** - May require JS execution to access content
3. **Browser fingerprinting** - Detecting headless browser signatures
4. **Rate limiting + IP blocking** - Aggressive blocking of automated access

Issue with Browser Fallback:
The anti-detection scraper's browser fallback is not triggering properly because:
- The exception is raised immediately on 403 errors
- Browser automation should activate after normal requests fail
- Need to investigate why Playwright fallback isn't working

Recommendation for Basketball-Reference:
- Fix the browser fallback logic in `anti_detection_scraper.py`
- Use residential proxies to avoid IP blocks

- Add longer delays between requests (10-30 seconds)
- Implement CAPTCHA solving if required
- Alternative: Use official basketball-reference API if available

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Current Scraper Status

Files Modified:

1. **/home/ubuntu/basketball_app/python-scraper/scrapers/nba_scraper.py**
   - Line 86: Season changed to "2024-25"
   - Line 182-197: Endpoint changed to "commonallplayers" with updated logic
   - Line 206-207: Player ID/name handling updated for new response structure

2. **/home/ubuntu/basketball_app/python-scraper/scrapers/basketball_reference_scraper.py**
   - Line 18: Added PLAYWRIGHT_BROWSERS_PATH environment variable
   - Line 34-35: Enabled browser mode (`use_browser=True`, `headless=True`)

Test Files Created:

- `test_nba_scraper.py` - Tests NBA API with new endpoint
- `test_basketball_ref.py` - Tests Basketball-Reference with browser automation

Database Status

Database Connection: ✅ Available
Database URL: `postgresql://role_98aaf8ef8:****@db-98aaf8ef8.db003.hosteddb.reai.io:5432/98aaf8ef8`

Player Data: ❌ No new data scraped (due to site blocking)

Reason: Cannot insert data into database because both scraping sources returned no data due to blocking.

Next Steps & Recommendations

Immediate Actions:

1. **Fix Browser Fallback Logic**
   - Debug why Playwright browser automation isn't activating
   - Ensure browser fallback triggers after HTTP 403 errors
   - Test with explicit browser-only mode

2. **Implement Proxy Rotation**
   - Add residential proxy service integration
   - Rotate IPs to avoid rate limiting
   - Consider using proxy services like ScraperAPI or Bright Data

3. **Add CAPTCHA Solving**
   - Integrate CAPTCHA solving service (2Captcha, Anti-Captcha)

- Handle Cloudflare challenges
- Implement manual fallback for difficult CAPTCHAs

Alternative Data Sources:

1. **NBA.com Alternatives**:
   - `balldontlie.io` API (free NBA stats API)
   - `sportsdata.io` API (paid but reliable)
   - NBA’s official developer portal
   - Scrape NBA’s public player pages instead of API

2. **Basketball-Reference Alternatives**:
   - Use their paid API/data service
   - Scrape during off-peak hours with longer delays
   - Manual data entry for elite shooters (one-time setup)
   - Use other stats sites: ESPN, StatMuse, etc.

Long-term Solutions:

1. **Seed Database with Static Data**
   - Create initial dataset of elite shooters manually
   - Use existing basketball databases
   - Update periodically rather than real-time scraping

2. **Official API Integration**
   - Subscribe to official NBA Stats API
   - Use Basketball-Reference’s Stathead service
   - Partner with sports data providers

3. **Hybrid Approach**
   - Use APIs for real-time data
   - Use scraping for historical/supplemental data
   - Manual updates for elite shooter database

Technical Details

Environment:

- Python: 3.11
- Playwright: 1.42.0
- Chromium: 123.0.6312.4
- Browser Path: `~/.cache/ms-playwright/`

Anti-Detection Features Active:

- ✅ User-Agent rotation
- ✅ Human-like delays (3-5 seconds)
- ✅ Session persistence with cookies
- ✅ Exponential backoff on failures
- ✅ Browser automation ready (Playwright installed)
- ⚠️ Browser fallback not triggering properly
- ❌ Proxy rotation not configured

- ❌ CAPTCHA solving not implemented

HTTP Headers Used:

```
{
    'Host': 'stats.nba.com',
    'User-Agent': 'Mozilla/5.0 (Windows NT 10.0; Win64; x64) Chrome/121.0.0.0',
    'Accept': 'application/json',
    'Accept-Language': 'en-US,en;q=0.9',
    'Accept-Encoding': 'gzip, deflate, br',
    'Connection': 'keep-alive',
    'x-nba-stats-origin': 'stats',
    'x-nba-stats-token': 'true',
    'Referer': 'https://stats.nba.com/',
    'Origin': 'https://stats.nba.com'
}
```

Conclusion

All user-requested fixes have been successfully implemented:

1. ✅ NBA endpoint changed to `/commonallplayers` with season “2024-25”
2. ✅ Playwright browsers installed (Chromium + FFMPEG)
3. ✅ Basketball-Reference scraper configured for browser automation

However, both websites are currently blocking automated access:
- NBA.com: Timeout errors (likely rate limiting or IP blocking)
- Basketball-Reference: 403 Forbidden errors (anti-scraping protection)

Next priority: Fix browser automation fallback logic to properly use Playwright when HTTP requests are blocked, then test with proxy rotation and longer delays.

Alternative recommendation: Use static seed data or official APIs while working on improving scraper reliability.