MyDrive Private Cloud

Comprehensive User, Administrator & Multi-Device Operations Manual

Architecture: FastAPI • SQLite (WAL) • Vanilla ES6+ SPA • Multi-User • Touch/Mobile Optimized

DEPLOYMENT / LOCATION	CONNECTION ADDRESS	MODE
Local Device Loopback	`http://127.0.0.1:8080`	Localhost loopback
Local Network (Wi-Fi / LAN)	`http://<HOST_IP>:8080`	Direct Gigabit LAN
Cloudflare Zero-Trust Tunnel	`https://<your-tunnel>.trycloudflare.com`	Encrypted WAN Tunnel
Tailscale / WireGuard Mesh	`http://100.x.y.z:8080`	Private P2P Overlay

1. System Overview & Core Capabilities

MyDrive is a modern, lightweight, self-hosted private cloud storage system with a clean Google-Drive-like user experience. Engineered with zero third-party telemetry, MyDrive gives you 100% data sovereignty. It can be deployed on standard Linux servers, Docker containers, Raspberry Pis, macOS, Windows WSL, and Android phones running Termux with Debian PRoot without root permissions.

Key Features:

- **Multi-User System:** Role-based access control (Admin vs User), user provisioning, quota limits, and per-user storage isolation.
- **Resumable Chunked Uploads:** Upload large multi-gigabyte files split into 4MB slices with real-time speed, ETA, and auto-resume.
- **In-Browser Media Streaming:** Stream audio and video using HTTP 206 Partial Content with instantaneous seeking.
- **Rich File Previews:** Integrated lightbox for photos, full PDF reader, and syntax-highlighted code and markdown viewer.
- **Secure Sharing:** Generate public or password-protected links with optional expiration dates and download-only flags.
- **Touch & Mobile Optimized:** Floating Action Button (FAB), bottom action sheets, safe-area inset support, pinch-to-zoom, and gestures.
- **Enterprise Security:** Argon2id hashing, CSRF tokens, HttpOnly SameSite cookies, brute-force lockout, and canonical path traversal defense.
- **Audit Logging:** Full administrative activity history tracking logins, file updates, shares, and system modifications.

2. Deployment & Installation Guide

Option A: Native Linux / Python Environment

```
# Clone repository & install dependencies
git clone <repository-url> mydrive && cd mydrive
python3 -m venv venv && source venv/bin/activate
pip install -r requirements.txt

# Generate environment configuration & initialize database
cp .env.example .env
python3 -m app.database

# Start server
python3 -m uvicorn app.main:app --host 0.0.0.0 --port 8080
```

Option B: Docker & Docker Compose

```
# Build and launch container in background
docker compose up -d
# Check logs
docker compose logs -f
```

Option C: Android Termux + Debian PRoot (24/7 Phone Cloud)

1. In Termux, run termux-setup-storage and termux-wake-lock.
2. Enter Debian: proot-distro login debian.
3. Navigate to mydrive and run: bash scripts/install.sh.
4. Start background service: bash scripts/start.sh (starts Uvicorn detached with setsid).
5. Disable Android battery optimization for Termux (Settings → Apps → Termux → Battery → Unrestricted).

3. First-Run Setup & User Onboarding

Zero-Config Initial Admin Setup: On first launch, visiting the app automatically detects an unconfigured database and displays the **Initial System Setup Wizard**. You will be prompted to create the primary administrator account. Passwords must be at least 8 characters long and are hashed with **Argon2id**. Once configured, the setup wizard is permanently locked.

Interface Layout:
• **Header:** Hamburger toggle, adaptive search bar with instant query matching, light/dark/system theme toggle, and profile avatar menu.
• **Sidebar:** '+ New' button (Upload File, Upload Folder, New Folder), navigation (My Drive, Recent, Starred, Shared Links, Trash), and live storage meter.
• **Content Area:** Interactive breadcrumb trail, multi-select toolbar, Grid/List view switcher, and file gallery.
• **Mobile Floating Action Button (FAB):** On screens ≤ 1024px, a quick FAB at the bottom right triggers a mobile bottom sheet for easy uploads.

4. Core Operations & Chunked Upload Engine

Large File Chunked Uploads: Standard browser uploads fail or crash low-memory devices on files larger than 1GB. MyDrive solves this with an asynchronous chunked streaming pipeline: files are sliced into 4MB binary pieces in userspace and streamed directly to disk. If Wi-Fi disconnects mid-upload, simply re-uploading the file instantly checks existing chunks on the server and resumes from the exact point of interruption with zero data loss.

Folder Hierarchy Uploads: Clicking '+ New' → 'Upload Folder' (or dragging an entire directory tree on desktop) preserves complete nested subfolder structures automatically.

Context Menu Operations: Right-clicking any item (or tapping the '■' action menu on mobile) provides:
• **Preview / Open:** Opens the file in the full-screen interactive lightbox.
• **Download:** Downloads the file or streams an on-the-fly zip archive for folders.
• **Star / Unstar:** Pins critical files into the Starred favorites view.
• **Rename / Move / Copy:** File tree management with atomic metadata updates and collision renaming (e.g., report (1).pdf).
• **Trash & Restore:** Safe two-stage deletion. Items move to the Trash folder and can be restored or purged permanently.

5. Universal In-Browser Media & Document Previews

• **Audio & Video:** Streams MP4, WebM, MKV, MP3, WAV, and OGG using HTTP 206 Partial Content range headers. Users can scrub through multi-hour movies or recordings instantly without buffering the entire file.
• **Images:** Fullscreen lightbox supporting PNG, JPG, WebP, SVG, GIF, AVIF, and HEIC with pinch-to-zoom and pan.
• **PDFs:** Native high-fidelity PDF viewer with page zoom, search, and navigation.
• **Code & Text:** Built-in syntax-colored code viewer for Python, JavaScript, HTML, CSS, JSON, YAML, Markdown, and shell scripts.

6. Public & Password-Protected Sharing Engine

Share files or entire directories with clients or friends without granting account access:
1. Right-click any file/folder → Select **'Get Share Link'**.
2. **Password Protection:** (Optional) Require a secure passphrase before access is granted.
3. **Expiration Timers:** (Optional) Set the link to expire automatically after 1 Hour, 1 Day, 7 Days, 30 Days, or Never.
4. **Download-Only Mode:** Prevent in-browser rendering for confidential documents.
5. The recipient receives a clean link (e.g., /s/TOKEN_ID). The owner can view download counters and revoke links at any time.

7. Contacts Management & Phone Address Book Sync

MyDrive includes a secure, self-hosted address book engine with multi-format import and export capabilities:
• **Direct Phone Address Book Upload:** On modern mobile browsers (e.g. Chrome on Android), tapping **'Import from Phone'** invokes the native Contact Picker API (navigator.contacts.select) with system permissions. You can pick any number of contacts from your device and upload them directly to your private cloud in one tap.
• **Manual Contact Management:** Add, view, edit, search, and delete contacts with name, phone, email, company, and notes.
• **Direct Dial & Email Integration:** Tap any phone number to place a call instantly (tel: link) or tap an email to compose a message.
• **vCard (.vcf) Import & Export:** Import or export contact backup files compatible with Android, iPhone, Google Contacts, Apple Address Book, and Outlook.
• **Spreadsheet CSV Import & Export:** Full CSV import with auto-detected columns and clean CSV export for spreadsheets and backups.
• **Favorites & Batch Operations:** Star important contacts, multi-select items, and perform bulk deletions.

8. Mobile Responsiveness & Touch Optimization Guide

MyDrive features an adaptive, app-like touch interface tailored for smartphones and tablets:
• **Safe-Area Inset Handling:** Full compatibility with device notches, Dynamic Islands, and curved status bars.
• **Compact Responsive Header:** Fits hamburger toggle, search bar, theme switcher, and profile avatar seamlessly down to 320px screens.
• **Mobile Action Bottom Sheet:** Replaces desktop context menus with native thumb-friendly bottom sheets on touch devices.
• **Multi-Touch Gestures:** Pinch-to-zoom (0.5x–4.0x), double-tap zoom (1x/2x), pull-down to dismiss, and swipe left/right between items.
• **Long-Press Selection:** Touch-and-hold any file card or list row for 500ms to activate multi-item selection with haptic feedback.

9. Multi-User Administration & Security Architecture

Role-Based Access Control (RBAC): Administrators have access to the User Management dashboard to create users, modify account status, reset passwords, and set storage quotas (e.g., 5GB, 20GB, or unlimited). Non-admin users are strictly isolated in their respective storage namespaces (data/storage/users/<user_id>).

Security Defenses:
• **Canonical Path Traversal Protection:** The resolve_safe_path() engine computes real canonical paths using os.path.realpath() and rejects directory escapes (../../) or symlink breakout attacks with HTTP 403.
• **Brute-Force Rate Limiting:** Tracks failed login attempts per IP and username, locking out attackers after 5 failures for 15 minutes.
• **Audit Logging:** Critical operations (logins, user creations, setting changes, file purges) are permanently recorded in the audit_logs table.

10. Maintenance, Process Management & Backups

COMMAND	PURPOSE & EXECUTION
`bash scripts/start.sh`	Starts MyDrive in the background detached using setsid.
`bash scripts/status.sh`	Displays running PID, memory usage, and health endpoint response.
`bash scripts/stop.sh`	Gracefully terminates the background server.
`bash scripts/restart.sh`	Restarts the application daemon.
`bash scripts/backup.sh`	Creates an atomic SQLite WAL backup and storage archive in data/backups/.
`pytest`	Executes the comprehensive automated test suite (40 integration and unit tests).

10. Troubleshooting & FAQ

Q1: Can I mount an external hard drive or SD card as storage?
Yes. Set STORAGE_ROOT=/path/to/mounted/drive in .env and restart the server. Ensure the process has read/write permissions.

Q2: How do I access MyDrive from outside my local Wi-Fi without port-forwarding?
Use Cloudflare Zero-Trust Tunnels: run cloudflared tunnel --url http://127.0.0.1:8080 to receive an encrypted global HTTPS URL.

Q3: How do I change an administrator password if I am locked out?
Run in terminal: python3 -c "from app.security import hash_password; from app.database import get_db; conn = get_db_connection(); conn.execute('UPDATE users SET password_hash=? WHERE username=?', (hash_password('NewPassword123!'), 'admin')); conn.close()".