

## Troubleshooting Guide (Atho)

Status: Alpha documentation snapshot (2026-03-12).

This guide collects common issues and fixes by area (network/P2P, APIs/auth, storage/LMDB, mining, Docker, build/tooling).

### Most Common Right Now (Fast Fixes)

- **\*\*Nodes won't start from GUI / start inconsistently\*\***
- Cause: stale background processes or PID conflicts.
- Fix:
  - `./venv/bin/python Src/Main/stop.py --active`
  - `./venv/bin/python Src/Main/stop.py --all`
  - start again from GUI Node tab or `Src/Main/runnode.py`.
- **\*\*GUI says auth/API key issue\*\***
- Cause: API key/user/password not set or mismatched between GUI and `Api_Keys.json`.
- Fix:
  - regenerate key: `./venv/bin/python Src/Api/auth.py`
  - re-enter values in GUI Settings.
- **\*\*Falcon/Kyber binary or compile failures\*\***
- Cause: missing compiler/toolchain or wrong platform binary.
- Fix:
  - follow compile sections in `README.md` and `Docs/quickstart.md`
  - register Falcon binary:
    - `./venv/bin/python Src/Falcon/Falcon/install_platform_binary.py`
    - confirm compiler exists (`clang/gcc/cc`).
- **\*\*Peer connects but later drops (Connection refused)\*\***
- Cause: peer process stopped, wrong target port, or service restart timing.
- Fix:
  - verify target node process still running (`stop.py --active`)
  - verify correct P2P port from `Src/Config/NodePorts.json`
  - restart both peers and recheck `logs/mainnet/network/network.log`.
- **\*\*Remote peers cannot connect to bootstrap IP\*\***
- Cause: bootstrap set to private LAN IP (`192.168.x.x`, `10.x.x.x`, `172.16-31.x.x`).
- Fix:
  - use public endpoint (DDNS/public IP + port-forward) or VPN mesh endpoint (Tailscale/ZeroTier)
  - keep LAN IP only for local-network testing.

### Network / P2P

- **\*\*Peers=0 / no headers:\*\*** Check `ATHO_BOOTSTRAP` and `network (ATHO_NETWORK)` match your seed; ensure P2P port (default 56000) is reachable. Clear peers: `rm Src/Config/Peers.json` and restart with `ATHO_RESET_PEERS=1`.
- **\*\*sync\_no\_headers or tip stuck at 0:\*\*** Often a network mismatch or genesis mismatch. Align `ATHO_NETWORK` across nodes; verify bootstrap points to the right chain.
- **\*\*Block rejects like 'Transaction' object has no attribute 'get':\*\*** Incoming blocks weren't deserialized to the expected dicts. Ensure all nodes run the same code/version; wipe stale storage if formats changed.
- **\*\*Port in use:\*\*** Pick a free P2P/API port (`ATHO_P2P_PORT`, `ATHO_FULLNODE_API_PORT`, `ATHO_MINERNODE_API_PORT`) or let `runnode.py` auto-assign. On Docker, avoid binding API ports if they conflict; use random host ports.
- **\*\*Different tips across nodes:\*\*** Confirm all nodes point to the same bootstrap seed and network; if a node lags, clear its storage/peers and resync.

- **\*\*Repeated sync\_headers\_ok but no progress:\*\*** The serving peer may be on a short fork or serving invalid blocks. Point to a trusted seed with the desired tip; stop low-tip peers.
- **\*\*Genesis mismatch:\*\*** Changing genesis content requires all nodes to resync; mixed genesis nodes will reject each other's chains.
- **\*\*Many rpc\_fail ... short\_header / reconnect churn at scale:\*\*** Tune peer/network concurrency and backoff to reduce dial storms and socket churn:
  - ATHO\_P2P\_RPC\_TIMEOUT=2.5 to 4.0 (lower probe RPC timeout)
  - ATHO\_PROBE\_BATCH\_SIZE=16 to 32 and ATHO\_PROBE\_WORKERS=4 to 12
  - ATHO\_OUTBOUND\_MAX\_NEW\_PER\_CYCLE=1 to 3 (limit new dials per keepalive cycle)
  - ATHO\_OUTBOUND\_RETRY\_BASE\_SECS=5 and ATHO\_OUTBOUND\_RETRY\_MAX\_SECS=300
  - ATHO\_DROPPED\_PEER\_READ\_DELAY\_SECS=120 to 300 (avoid immediate re-add of failing peers)
  - ATHO\_SYNC\_PEERS\_PER\_CYCLE=3 to 6 (cap sync fan-out)
  - ATHO\_P2P\_SERVER\_CLIENT\_WORKERS=32 to 128 (bound inbound worker pool)
- **\*\*Slow block relay on larger responses:\*\*** Current relay path intentionally strips export-only block fields (tx\_list\_full, derived counters) before wire send. If peers still lag, check message-size cap (ATHO\_MAX\_MESSAGE\_SIZE) and peer CPU/network limits.
- **\*\*reorg\_depth\_exceeded rejects:\*\*** A competing branch exceeded policy rollback cap (max\_reorg\_depth\_blocks). Review CHECKPOINT\_INTERVAL\_BLOCKS, MAX\_REORG\_CHECKPOINT\_MULTIPLIER, and MAX\_REORG\_DEPTH\_BLOCKS in Src/Utility/const.py.
- **\*\*P2P logs are too noisy:\*\*** Current defaults keep high-volume tx/inv/getdata lines at DEBUG and dedupe repeated INFO lines.
- keep default lightweight mode:
  - ATHO\_NETLOG\_LEVEL=INFO
  - ATHO\_NETLOG\_DEDUP\_SECONDS=45
  - temporarily increase detail:
    - ATHO\_NETLOG\_LEVEL=DEBUG
    - ATHO\_NETLOG\_TX\_ACTIVITY\_INFO=1
- send propagation/recovery diagnostics are in:
  - logs/<network>/api/send\_intent\_audit.log

#### API / Auth

- **\*\*401/403 errors:\*\*** Missing/invalid X-API-Key/X-User/X-Pass or missing permissions (e.g., send\_tx, mining). Check Src/Config/Api\_Keys.json; recreate keys with Src/Api/auth.py if needed
- **\*\*HMAC failures:\*\*** If REQUIRE\_HMAC is on, include X-TS and X-Sig for every request; ensure clock skew < -60s.
- **\*\*CLI can't connect:\*\*** Verify ATHO\_API\_URL (CLI reads Src/Config/NodePorts.json). If using Docker, use the host-mapped API port from docker compose port.
- **\*\*HTTP 500 from API:\*\*** Often missing deps or missing API key file in container. Rebuild image and ensure Src/Config/Api\_Keys.json exists/mounted; check container logs for import errors.

#### GUI / Web Explorer

- **\*\*Request inbox icon appears in wrong place / top-bar alignment looks off\*\***
- Cause: stale GUI process or older local GUI file loaded from another path/release folder.
- Fix:
  - fully stop GUI and relaunch from the same repo/venv path,
  - verify you run Src/GUI/gui.py from this workspace,
  - if needed clear stale Python caches and restart.
- **\*\*Clicking inbox does not open request page\*\***
- Cause: stale GUI process or feature-disabled runtime.
- Fix:
  - restart GUI from this workspace/venv,
  - note: current alpha build keeps request inbox UI disabled by default,

- confirm requests page is present only in builds where it is explicitly enabled,
- verify node/API is reachable and authenticated.
- **\*\*Fund request -> Send security step fails\*\***
- Cause: pasted verification address does not exactly match requester address.
- Fix:
  - use Copy Request Address,
  - paste exact value into verify field,
  - continue (send modal prefill opens only on exact match).
- **\*\*Explorer popup says it cannot start bridge:\*\*** Ensure GUI can read/write Src/GUI/web\_explorer.html and that local loopback bind is available (127.0.0.1). Restart GUI and try again.
- **\*\*Explorer opens but stats show -- / no peers/tip hash:\*\*** Verify node API is reachable and authenticated by GUI; check /chain/info and /network/node\_count from the active API port.
- **\*\*Address search returns invalid\_address:\*\*** Explorer accepts Base56 or HPK; verify no whitespace/newlines were copied and network prefix matches the selected chain.
- **\*\*Explorer page feels stale:\*\*** click Refresh in explorer, then refresh node/API state in GUI if local node role changed.

#### Storage / LMDB

- **\*\*LMDB file not found / map full:\*\*** Ensure storage paths exist; increase map size if needed. Clean start: remove blockchain\_storage\* if you intend to resync.
- **\*\*Corruption/stale data after upgrades:\*\*** Wipe blockchain\_storage\* and Peers.json and resync; keep backups before deleting.
- **\*\*Permission errors on LMDB:\*\*** Ensure the process/container user can write to the volume; adjust ownership/permissions on macOS/Linux.

#### Mining

- **\*\*Miner mining its own fork:\*\*** Bootstrap it to the authoritative node (ATHO\_BOOTSTRAP=<seed>:56000), align networks, and clear peers/storage if formats changed.
- **\*\*Reward/balance not showing:\*\*** Ensure API auth headers are present; check mempool/UTXO sync; confirm the address mapping (HPK/Base56) is correct.
- **\*\*HTTP 403 on wallet send:\*\*** The API key lacks send\_tx or password is wrong; recreate key with proper permissions.
- **\*\*broadcast\_rejected: Invalid pubkey: pubkey must use canonical base64 wire encoding:\*\*** The node is enforcing canonical witness wire encoding and rejected hex witness payloads. Ensure sender/receiver nodes are on the updated code path and restart wallet/full/miner together.
- **\*\*block\_tx\_verify\_failed with Fee ... below required minimum ... (vsize=...) after mempool accepted:\*\*** Usually version skew or stale runtime where one path sizes tx differently. Run one code version across wallet/full/miner, restart all processes, clear stale mempool entries, and retry.
- **\*\*PoW workers not scaling or unexpectedly single-core:\*\*** Check POW\_WORKER\_CORES, POW\_MULTIPROCESS\_ENABLED, and POW\_WORKER\_NONCE\_CHUNK in constants/env. If requested cores exceed available CPUs, runtime caps to max CPU count and logs the cap event.
- **\*\*Miner prints too frequently / console overhead:\*\*** raise POW\_PROGRESS\_INTERVAL\_SEC to reduce progress-print I/O.
- **\*\*Wallet import fails:\*\*** The GUI import accepts Atho .txt exports in both current structured format and legacy warning-header format. Duplicates by HPK/Base56 are rejected/skipped. If the identifier already exists but HPK/Base56 is unique, the importer auto-renames to import\_#.
- **\*\*Mnemonic restore mismatch:\*\*** Ensure the phrase words and order are exact, and use the same passphrase/account/index used at creation time. A different passphrase/path intentionally derives a different key.
- **\*\*CLI shows API reported non-canonical recovery mode... after a successful mnemonic recover:\*\***

This can happen when the recovered key is an existing additional miner key outside canonical slots (for example miner\_3). On current builds, this path is reported as informational (Recovered existing key outside canonical miner slots.). If you still see the old warning, update to the latest code and restart the wallet API process.

- **Key manager startup fails with schema validation error:** The key file failed strict structure validation. Check Keys/backups/ for the last known backup, repair malformed records, and restart. Runtime now fails closed instead of silently accepting malformed key JSON.
- **unsupported hash type during mnemonic operations:** On some Python/OpenSSL builds, native pbkdf2\_hmac('sha3\_512') is unavailable. Install project dependencies (cryptography) so the accelerated SHA3-512 PBKDF2 path is used.
- **Cannot delete address:** Deletion is blocked only if it would remove the last key on the selected network. Ensure at least two keys exist; defaults are reassigned automatically when a key is removed.
- **Hashrate stuck / no blocks:** Verify mining is enabled, check logs for PoW errors, and ensure the mempool isn't rejecting constructed blocks.

#### Docker / Compose

- **Port binding errors:** If a host port is in use, remove the mapping or use random host ports (e.g., ports: ["10200"]). P2P ports are fixed (56000 in-container; host binds 56000/56001/56002/56003).
- **API key missing in containers:** Entry point auto-creates one; read logs for the generated key/user/pass. Ensure Src/Config is mounted.
- **Containers not following host chain:** Set ATHO\_BOOTSTRAP=host.docker.internal:56000 (or your LAN IP) and wipe peers/storage before docker compose up.
- **Modules missing in container:** Rebuild after updating requirements.txt (docker compose build --no-cache); ensure Python is 3.11 in the image.
- **Random API ports on miners:** Discover with docker compose port miner 10200 (and ... 10250 for miner2) when host ports are randomized.

#### Build / Tooling

- **falcon\_cli build fails:** Install toolchain (build-essential/clang/libssl-dev on Linux; Xcode CLT on macOS). On ARM, disable AVX2 (FALCON\_USE\_AVX2=false). Use Docker to avoid local toolchain issues.
- **falcon\_cli pinning is required but no expected digest is configured:** Update Constants.FALCONCLI\_PINNED\_VERSION\_DIGESTS in Src/Utility/const.py for the active CONSENSUS\_VERSION, using the release-audited version-bound digest. Mainnet/testnet startup is intentionally blocked until this is set.
- **Runtime guard fail-closed startup error:** If startup reports runtime guard bootstrap failure, inspect logs/<network>/security/security.log, verify Src/Config/security\_manifest.json and ensure ATHO\_RUNTIME\_GUARD\_RELEASE\_PUBKEY\_HEX matches release signer pubkey when signature required.
- **runtime\_guard\_violation during runtime:** In enforce mode this is expected fail-closed behavior on drift. Re-deploy clean artifacts, re-verify manifest, and restart nodes from trust release package.
- **python not found / deps missing:** Use Python 3.11+, activate venv, pip install -r requirements.txt.
- **LibreSSL/SSL warnings:** Typically harmless locally; if you see handshake errors, upgrade OpenSSL/Python.

#### Dependency install issues (venv + pip)

- **Use a virtual environment first (strongly recommended)**
- **Why:** avoids global package conflicts and broken mixed installs.

macOS / Linux:

Windows (PowerShell):

- **\*\*lmdb install fails\*\***
- First retry inside activated venv:
- `python -m pip install lmdb`
- If still failing, install OS build tools then retry:
- macOS: `xcode-select --install`
- Linux (Debian/Ubuntu): `sudo apt-get install -y build-essential python3-dev`
- Windows: install Visual Studio Build Tools or use MSYS2/WSL
- **\*\*kivy/graphics deps fail\*\***
- Confirm OpenGL 2.0 capable system/drivers.
- Keep installs inside venv and retry `python -m pip install -r requirements.txt`.
- **\*\*cryptography/hash-related install or runtime errors\*\***
- Upgrade packaging tools in venv (`pip setuptools wheel`) and reinstall requirements.
- This dependency is required for fallback SHA3-512 PBKDF2 paths used in wallet operations.

General tips

- Align versions across all nodes; mismatched code can reject blocks/tx.
- When in doubt, clean state: stop nodes, `docker compose down -v`, remove `blockchain_storage*`, `Keys*`, `Logs*`, `Src/Config/Peers.json`, then restart with correct env.
- Check logs at source (not just grep): `docker compose logs -f fullnode miner miner2` or `tail Logs*/network.log` for detailed reasons.
- For hashrate telemetry validation, query:
- `/network/hashrate/live`
- `/network/hashrate/chart`
- `/network/hashrate`