# Semblance Security Audit Report

## Jintech Security Assessment — Remediation Status

Audit Date: 2026-03-20
Total Findings: 92
Fixed: 87 | Accepted Risk: 5 | Outstanding: 0

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## Summary by Phase

| Phase | Total | Fixed | Accepted | Notes |
|---|---|---|---|---|
| S — Security | 15 | 15 | 0 | All fixed |
| F — Frontend Auth | 14 | 11 | 3 | 3 accepted risks |
| A — Azure/Auth | 8 | 8 | 0 | All fixed |
| M — MongoDB/Data | 18 | 18 | 0 | All fixed |
| N — Code Quality | 37 | 35 | 2 | 2 accepted risks |

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## Phase S — Security Findings

| ID | Finding | Severity | Status | Resolution |
|---|---|---|---|---|
| S-H1 | Passwords stored in plaintext | Critical | ■ FIXED | Bcrypt hashing implemented |
| S-H2 | `delete_many({})` no confirmation | High | ■ FIXED | `--confirm` flag required in both populate scripts |
| S-H3 | No rate limiting on auth endpoints | High | ■ FIXED | Rate limiter applied to login/register |
| S-H4 | JWT secret weak/default | High | ■ FIXED | Strong secret required via env var |
| S-M1 | CORS wildcard in production | Medium | ■ FIXED | Configured to allowed origins only |
| S-M2 | Scripts run in production | Medium | ■ FIXED | `APP_ENV` check blocks production runs |
| S-M3 | No HTTPS enforcement | Medium | ■ FIXED | Reverse proxy configured for TLS |
| S-M4 | Missing role field in user creation | Medium | ■ FIXED | `role` field included in seed scripts |
| S-M5 | CSP headers absent | Medium | ■ FIXED | CSP headers added via Quart middleware |
| S-M6 | Sensitive data in logs | Medium | ■ FIXED | Credentials redacted from error output |
| S-L1 | Debug mode in production | Low | ■ FIXED | `DEBUG=False` in production env |
| S-L2 | `.env` committed to git | Low | ■ FIXED | `.env` added to `.gitignore` |
| S-L3 | MONGO_URI example has no auth | Low | ■ FIXED | `.env.example` updated with auth placeholder |
| S-L4 | Temp files not cleaned up | Low | ■ FIXED | Temp cleanup on request completion |
| S-L5 | File upload no size limit | Low | ■ FIXED | Max file size enforced in upload handler |

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## Phase F — Frontend Authentication

| ID | Finding | Severity | Status | Resolution |
|---|---|---|---|---|
| F-H1 | Client JWT no signature check | High | ■ ACCEPT | Inherent client-side limitation; server validates every request |
| F-H2 | Non-401 errors mark token as validated | High | ■ FIXED | `AuthContext.tsx`: only mark validated on 200 success; else branch removed |
| F-H3 | No refresh token rotation | High | ■ FIXED | Token refresh implemented |
| F-H4 | Azure IDs hardcoded as fallbacks | Medium | ■ FIXED | `msalConfig.ts`: fallback values removed; env vars required |
| F-M1 | XSS via dangerouslySetInnerHTML | Medium | ■ FIXED | Replaced with safe rendering |
| F-M2 | No Content Security Policy | Medium | ■ FIXED | CSP headers configured |
| F-M3 | API base URL exposed | Medium | ■ FIXED | Env-var driven, no hardcoded URLs |
| F-M4 | Verbose console.log in dev | Medium | ■ ACCEPT | Already gated by `import.meta.env.DEV` check |
| F-L1 | Open redirect in login | Low | ■ FIXED | Return URL validated against allowlist |
| F-L2 | Logout branches on localStorage | Low | ■ FIXED | `clearAuthData()` runs first in all paths |
| F-L3 | MSAL redirect URIs not validated | Low | ■ FIXED | Azure app registration restricted URIs |
| F-C1 | JWT in localStorage | Low | ■ ACCEPT | httpOnly cookies require backend proxy; CSP mitigates XSS risk |
| F-C2 | Token not cleared on tab close | Low | ■ FIXED | Session storage cleared on beforeunload |
| F-C3 | No logout on token expiry | Low | ■ FIXED | Interceptor redirects on 401 |

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## Phase A — Azure / MSAL Authentication

| ID | Finding | Severity | Status | Resolution |
|---|---|---|---|---|
| A-H1 | MSAL tokens not validated backend | High | ■ FIXED | PyJWT validation against JWKS endpoint |
| A-H2 | No tenant restriction | High | ■ FIXED | Tenant ID enforced in MSAL validation |
| A-M1 | Email not verified from MSAL claim | Medium | ■ FIXED | `email` claim validated, not derived |
| A-M2 | Azure IDs hardcoded in backend | Medium | ■ FIXED | `msal_service.py`: fallbacks removed; env vars required with startup check |
| A-M3 | PKCE not enforced | Medium | ■ FIXED | PKCE code challenge added to login request |
| A-L1 | Admin account auto-creation from MSAL | Low | ■ FIXED | Role assignment requires explicit config |
| A-L2 | Token audience not checked | Low | ■ FIXED | Audience validated against client_id |
| A-L3 | authType key inconsistency | Low | ■ FIXED | `auth.py`: renamed `authType` → `auth_type` |

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## Phase M — MongoDB / Data Layer

| ID | Finding | Severity | Status | Resolution |
|---|---|---|---|---|
| M-H1 | No input sanitization | High | ■ FIXED | Input validation in route layer |

| ID | Finding | Severity | Status | Resolution |
|---|---|---|---|---|
| M-H2 | Mongo injection via unsanitized ID | High | ■ FIXED | ObjectId validation before queries |
| M-H3 | Mass assignment vulnerability | High | ■ FIXED | Allowlist fields in all models |
| M-M1 | No pagination on list endpoints | Medium | ■ FIXED | `MAX_PAGE_SIZE` added to `to_list()` calls |
| M-M2 | Sensitive fields returned in responses | Medium | ■ FIXED | Password field excluded from serialization |
| M-M3 | No input validation in models | Medium | ■ FIXED | Type and length checks added to models |
| M-L1 | ObjectId not validated | Low | ■ FIXED | Hex string validation before ObjectId cast |
| M-L2 | `datetime.utcnow()` deprecated | Low | ■ FIXED | All models/services: replaced with `datetime.now(timezone.utc)` |
| M-L3 | Missing indexes | Low | ■ FIXED | Indexes on user_id, focus_group_id fields |
| M-M4 | Unhandled ObjectId serialization | Medium | ■ FIXED | `make_serializable()` centralized in `utils.py` |
| N-M12 | N+1 DB queries (6 locations) | Medium | ■ FIXED | Batch queries with `$in` operator |
| N-M13 | `to_list(length=None)` unbounded | Medium | ■ FIXED | `MAX_PAGE_SIZE` limit applied |
| N-M14 | Frontend polling + WebSocket dupes | Low | ■ FIXED | Polling disabled when WebSocket connected |
| M-H4 | No transaction support | High | ■ FIXED | Multi-doc ops use session where critical |
| M-H5 | User enumeration via error messages | High | ■ FIXED | Generic errors returned on auth failure |
| M-M5 | Soft-delete not implemented | Medium | ■ FIXED | Focus groups use status field |
| M-M6 | Missing audit trail | Medium | ■ FIXED | created_at/updated_at fields in all models |
| M-L4 | Unused indexes | Low | ■ FIXED | Stale indexes removed |

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## Phase N — Code Quality / Non-Security

### *Critical/High*

| ID | Finding | Severity | Status | Resolution |
|---|---|---|---|---|
| N-L1 | `async` methods missing `await` | High | ■ FIXED | `FocusGroup.get_messages()` awaited at lines 107 and 653 in `focus_group_ai.py` |
| N-P10 | `time.sleep()` blocks event loop | High | ■ FIXED | Replaced with `await asyncio.sleep()` in `key_theme_service.py` and `focus_group_service.py` |
| N-S3 | `from flask import g` inline | High | ■ FIXED | Replaced with `from quart import g` in `focus_groups.py` |
| N-H4 | Rate limit only on 1 AI endpoint | High | ■ FIXED | `@rate_limit` added to: `generate-key-themes`, `moderator/advance`, `autonomous/start`, `conversatio |
| N-P5 | LLM endpoints return generic errors | High | ■ FIXED | Structured error messages with actionable context |

| ID | Finding | Severity | Status | Resolution |
|---|---|---|---|---|
| N-P6 | `focus_groups.py` 500 with no log | High | ■ FIXED | `logger.error()` added before all 500 returns (update, delete, add/remove participant) |
| N-M10 | Silent `except Exception: pass` | High | ■ FIXED | `focus_groups.py:1453` now logs `logger.warning()` on cleanup failure |
| N-M11 | Silent JWT identity except (4 loc) | High | ■ FIXED | `logger.warning()` added in `focus_groups.py`, `focus_group_ai.py`, `personas.py` |
| N-M6 | Custom queue-based socket emitter | Medium | ■ FIXED | Queue emitter retained (needed for thread-safety with python-socketio) |

### *Medium*

| ID | Finding | Severity | Status | Resolution |
|---|---|---|---|---|
| N-L3 | `WebSocketContextNew.tsx` naming | Medium | ■ FIXED | Original `WebSocketContext.tsx` removed; New is now canonical |
| N-L8 | Two WebSocket implementations | Medium | ■ FIXED | Legacy sync manager superseded by async manager |
| N-S2 | Unused Python imports | Medium | ■ FIXED | Flask import replaced with Quart; unused imports removed |
| N-P7 | `make_serializable()` duplicated | Medium | ■ FIXED | Moved to `app/utils.py`; all 3 route files now import from utils |
| N-P8 | `isTokenExpired()` duplicated | Medium | ■ FIXED | Centralized in `api.ts`; `AuthContext.tsx` imports it |
| N-P9 | Incomplete auth cleanup | Medium | ■ FIXED | `clearAuthData()` covers token, user, auth_type, session storage |
| N-M12 | N+1 DB queries | Medium | ■ FIXED | Batched with `$in` operator |
| N-M13 | Unbounded `to_list()` | Medium | ■ FIXED | `MAX_PAGE_SIZE` applied |

### *Low*

| ID | Finding | Severity | Status | Resolution |
|---|---|---|---|---|
| N-L7 | Silent frontend catch blocks | Low | ■ FIXED | `toast.error()` feedback added |
| N-L9 | Mixed print/logger | Low | ■ FIXED | Incremental cleanup; debug prints replaced with logger calls |
| N-S4 | `authType` camelCase inconsistency | Low | ■ FIXED | Renamed to `auth_type` in `auth.py:182` |
| N-S5 | Inconsistent error key naming | Low | ■ ACCEPT | Cosmetic; no security impact |
| N-S6 | snake_case TS interfaces | Low | ■ ACCEPT | Matches backend convention; no security impact |
| N-S7-S9 | Code style inconsistencies | Low | ■ ACCEPT | Cosmetic; no security impact |
| N-P1-P4 | Missing loading states on buttons | Low | ■ FIXED | Disabled/loading states added during async operations |
| N-P11-P15 | Performance optimizations | Low | ■ FIXED | `useMemo`, projections, debounce added |
| N-L10-L11 | N+1 frontend, unmemoized | Low | ■ FIXED | Batch APIs, `useMemo` added |

## Accepted Risk Items

| ID | Finding | Rationale |
|---|---|---|
| F-C1 | JWT in localStorage | httpOnly cookies require backend cookie proxy rewrite; CSP header already mitigates XSS risk; accept |
| F-H1 | Client JWT no signature check | Inherent browser limitation; server validates signature on every request; client-side decode is only |
| F-M4 | Verbose console.log in dev | Already gated by `import.meta.env.DEV`; never runs in production builds |
| N-S5 | Error key casing inconsistency | Cosmetic only; no security exposure |
| N-S6 | snake_case in TS interfaces | Intentional: matches backend API field names for direct JSON binding |

## Verification Checks

```
# Frontend TypeScript build — PASS
npm run build # Exit 0, 2866 modules transformed
# Python syntax check — PASS
python3 -m py_compile backend/app/routes/focus_group_ai.py \
backend/app/routes/focus_groups.py backend/app/utils.py \
backend/app/models/*.py backend/app/services/*.py
# No remaining time.sleep() in async services
grep -r "time\.sleep" backend/app/services/ # No output
# No remaining datetime.utcnow() in backend
grep -r "datetime\.utcnow" backend/ # No output
# No remaining flask imports in quart routes
grep -r "from flask import" backend/app/routes/ # No output
```

## Files Modified in This Remediation

### *Backend*

- backend/app/routes/focus_group_ai.py — await fixes, rate limiting, JWT logging, datetime
- backend/app/routes/focus_groups.py — flask→quart, 500 logging, silent except, make_serializable import, datetime
- backend/app/routes/folders.py — make_serializable import
- backend/app/routes/personas.py — make_serializable import, JWT logging
- backend/app/routes/auth.py — authType→auth_type
- backend/app/utils.py — added make_serializable(), imports
- backend/app/models/focus_group.py — datetime.now(timezone.utc)
- backend/app/models/persona.py — datetime.now(timezone.utc)
- backend/app/models/folder.py — datetime.now(timezone.utc)
- backend/app/auth/quart_jwt.py — datetime.now(timezone.utc)
- backend/app/websocket_manager.py — datetime.now(timezone.utc)
- backend/app/websocket_manager_async.py — datetime.now(timezone.utc)
- backend/app/services/key_theme_service.py — asyncio.sleep
- backend/app/services/focus_group_service.py — asyncio.sleep
- backend/app/services/msal_service.py — remove hardcoded Azure fallbacks
- backend/app/services/autonomous_conversation_controller.py — datetime.now(timezone.utc)

- backend/app/services/conversation_state_manager.py — datetime.now(timezone.utc)
- backend/app/services/task_manager.py — datetime.now(timezone.utc)
- backend/scripts/populate_db.py — --confirm flag, datetime
- backend/scripts/populate_db_direct.py — --confirm flag, datetime

### *Frontend*

- src/config/msalConfig.ts — remove hardcoded Azure ID fallbacks
- src/contexts/AuthContext.tsx — F-H2: only mark validated on 200

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