

ORO 9

POS System

Complete Project Documentation

Multi-Tenant Point of Sale System

for Franchise Businesses

January 2026

1. System Overview

ORO 9 is a comprehensive multi-tenant Point of Sale (POS) system designed for franchise businesses across multiple verticals including liquor stores, vape shops, salons, restaurants, and retail operations.

The system is built to scale from a single storefront to massive franchise operations (5,000+ stores), providing deep hierarchical management and real-time operational insights.

ORO 9 utilizes a Single-App Multi-Vertical Strategy, allowing one binary to serve Salon, Retail, and Restaurant operations via dynamic UI reconfiguration.

Supported Business Verticals

- Liquor Stores - Age verification, inventory tracking, dual pricing
- Vape Shops - Compliance features, product catalogs
- Salons/Barbershops - Appointments, services, employee scheduling
- Restaurants - Menu management, table ordering
- General Retail - Full POS, inventory, customer loyalty

Multi-Tenant Hierarchy (4 Tiers)

- PROVIDER (ORO 9) - The platform root and system administrator
- FRANCHISOR (Brand Layer) - A brand or chain owner (e.g., "Brand ABC"). Owns BusinessConfig and Brand Catalog
- FRANCHISE (Store Owner) - Individual business entities/owners who may manage one or more stores
- LOCATION (Physical Store) - The physical context for POS terminals. All transactions, employees, inventory scoped here

2. Technology Stack

Core Technologies

Layer	Technology
Web Frontend	Next.js 16+ (App Router), React 19, TypeScript, Tailwind CSS
Mobile/Tablet	Native Kotlin (Android) with Jetpack Compose
Backend	Next.js Serverless API Routes (hosted on Vercel)
Database	Prisma ORM with PostgreSQL (Cloud) / SQLite + Room (Local)
Authentication	NextAuth.js (Web) / Session Tokens & Bearer Tokens (Mobile)
SMS Service	Twilio for transactional and marketing SMS
File Storage	AWS S3 for onboarding documents and assets
Payments	PAX Terminal integration (TCP/IP and on-device SDK)

Key Dependencies

- @prisma/client - Database ORM for type-safe queries
- next-auth - Authentication and session management
- jspdf - PDF generation for receipts and reports
- qrcode.react - QR code generation for customer display
- lucide-react - UI icons
- swr - Data fetching and caching
- date-fns - Date/time utilities
- bcrypt/bcryptjs - Password hashing
- jsonwebtoken - JWT token handling

Design Principles

- Unified Cloud Backbone - Single Source of Truth for all data
- Hybrid Persistence - Cloud PostgreSQL + Local caching for offline resilience
- Hardened Multi-Tenancy - Per-request ownership checks (IDOR guards)
- Synchronized Manifestation - Physical replication of brand templates for performance

3. Key Features

Transaction Management

- Dual pricing support (Cash/Card with configurable surcharge)
- Split payments across multiple methods
- Tips with percentage presets and custom amounts
- Tax-on-charged-price calculations
- Voids and refunds with mandatory audit logging
- Smart Home Tiles - Dynamic product suggestions

Payment Integration

- PAX terminal TCP/IP proxy for distributed terminals
- On-device SDK for integrated smart terminals
- Offline mode with IndexedDB sync
- Cash drawer management and drops

Customer Loyalty & CRM

- Points-based loyalty program
- VIP tier system with automatic upgrades
- Fair Discount System (best-offer logic)
- Customer streaks and engagement tracking
- Marketing consent management (PEWC compliance)

Inventory Management

- SKU lookup engine with barcode scanning
- Low stock alerts with configurable thresholds
- Cross-store inventory visibility
- Auto-reorder logic and purchase orders
- SharedUPCProduct - Crowdsourced product database

3. Key Features (Continued)

Employee Operations

- PIN-based POS login for quick switching
- Time clock with server-authoritative tracking
- Shift/cash drawer management
- Employee compensation tracking (W2 vs Booth Renter)
- Role-based permissions and access control
- Commission and tips reporting

Salon-Specific Features

- Appointment booking with partial booking support
- Services catalog with Brand Catalog inheritance
- Employee scheduling and availability
- Client management and service history
- Walk-in queue management

Communication

- Automated SMS/Email receipts
- Marketing campaign management
- Appointment reminders
- Deal suggestions with AI-powered recommendations
- SMS quota management with 1500 free monthly messages

Compliance & Audit

- Unified AuditLog for all sensitive actions
- Financial record immutability (no deletions)
- Hierarchical feature flags (Station > Location > LLC > HQ)
- 5-stage compliant offboarding process
- GDPR/CCPA data retention protocols

4. Database Schema

Core Management Models

Model	Description
Provider	Platform root entity representing ORO 9
Franchisor	Brand/chain owner with BusinessConfig settings
Franchise	Individual store owner group (LLC)
Location	Physical storefront with terminals and settings
User	Account identity with roles and permissions
Client	Customer profiles with loyalty and marketing data

Transactional & POS Models

Model	Description
Product	Inventory items for retail
Service	Service items for salons/service businesses
Transaction	Master record for sales with line items
Station	POS terminals/registers with hardware bindings
Appointment	Flexible booking records with partial support
DrawerSession	Cash drawer lifecycle tracking
AuditLog	Centralized sensitive action tracking
TimeClockSession	Employee clock in/out records

Brand Catalog Models

GlobalServiceCategory	HQ-managed service categories
GlobalService	Master service templates from Brand HQ
LocationServiceOverride	Per-location customizations

5. API Structure

The system includes 497+ API routes organized by functionality:

Core API Categories

Category	Endpoints
/api/auth/*	Authentication, login, password management
/api/pos/*	Point of sale operations, checkout, payments
/api/inventory/*	Product management, stock, purchase orders
/api/transactions/*	Sales history, refunds, voids
/api/customers/*	Customer CRM, loyalty, search
/api/employees/*	Employee management, schedules, time clock
/api/appointments/*	Booking management (salon vertical)
/api/reports/*	Analytics, sales reports, dashboards
/api/admin/*	Administrative functions, settings
/api/franchisor/*	HQ/Brand management endpoints
/api/provider/*	Platform-level administration
/api/pax/*	Payment terminal integration
/api/sms/*	SMS messaging and campaigns
/api/pulse/*	Real-time analytics and alerts

Authentication Patterns

- Web: NextAuth session-based authentication
- Mobile: Bearer token with JWT verification
- Hybrid endpoints support both auth methods
- Role-based access control on all endpoints
- Franchise/Location scope enforcement

6. User Portals & Interfaces

Administrative Portals

Portal	Description
/provider/*	Platform-wide administration, dealer management, account provisioning
/franchisor/*	Brand HQ management, reports, catalog, franchisee oversight
/dashboard/*	Store management (165+ pages) - POS, inventory, employees, reports
/owner/*	Business owner specific features and settings

Operational Interfaces

/employee/*	Employee self-service portal
/employee-login	PIN-based quick employee login
/staff-login	Staff authentication page
/my-schedule	Employee schedule viewing
/my-services	Employee service assignments

Customer-Facing Interfaces

/kiosk/*	Customer self-checkout kiosk
/customer-display	Receipt/payment display screen
/book/*	Online appointment booking
/pulse/*	Analytics dashboard

Mobile Applications

- Native Android POS - Kotlin with Jetpack Compose
- WebView hybrid for checkout flows
- Offline Room database for resilience
- Direct hardware integration (PAX, printers)

7. Security & Compliance

Authentication & Authorization

- Role-Based Access Control (RBAC) with roles: PROVIDER, FRANCHISOR, OWNER, MANAGER, EMPLOYEE
- Multi-tenant data isolation with per-request ownership checks
- Approval Guard - Merchants must be APPROVED to access core routes
- Dual-Identity Authorization for corporate resources
- JWT Bearer tokens for mobile with mandatory verification

Financial Security

- Transaction Immutability - Financial records cannot be deleted
- Linked Reversals - Every refund/void references original transaction
- Mandatory audit metadata (reason, approvedBy) for reversals
- Append-only event logs for financial operations

Audit & Compliance

- Unified AuditLog capturing all sensitive actions
- Activity logging with logActivity() for permanent audit trail
- PCI data flow compliance
- GDPR/CCPA compliant data handling
- 5-stage offboarding (SUSPENDED, EXPORT, ANONYMIZE, ARCHIVED)

Infrastructure Security

- Environment variable protection for secrets
- Secure password hashing with bcrypt
- Input validation and sanitization
- CORS and CSP headers configured

8. Deployment & Configuration

Required Environment Variables

Variable	Description
DATABASE_URL	PostgreSQL connection string
NEXTAUTH_SECRET	NextAuth.js secret key
NEXTAUTH_URL	Application base URL
TWILIO_ACCOUNT_SID	Twilio account identifier
TWILIO_AUTH_TOKEN	Twilio authentication token
TWILIO_PHONE_NUMBER	Twilio sending phone number
AWS_ACCESS_KEY_ID	AWS S3 access key
AWS_SECRET_ACCESS_KEY	AWS S3 secret key
AWS_S3_BUCKET	S3 bucket name for document storage

Quick Start Commands

```
# Install dependencies
npm install

# Generate Prisma client
npx prisma generate

# Push database schema
npx prisma db push

# Seed database (optional)
npx prisma db seed

# Run development server
npm run dev

# Build for production
npm run build
```

Hosting

- Primary: Vercel (serverless deployment)
- Database: PostgreSQL (Vercel Postgres, Supabase, or similar)
- File Storage: AWS S3
- SMS: Twilio

9. Documentation & Resources

Available Documentation Files

File	Description
README.md	Project overview and quick start
SYSTEM_DOCUMENTATION.md	Detailed architecture documentation
API_REFERENCE.md	API endpoint reference
DATABASE_SCHEMA.md	Database model documentation
DEVELOPER_GUIDE.md	Developer onboarding guide
ARCHITECTURE.md	System architecture details

Project Statistics

- 938+ source files in /src directory
- 497+ API routes
- 165+ dashboard pages
- 53+ Prisma schema files
- 44+ utility scripts

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