

ServeFlow AI

Architecture & Progress Documentation

1. Project Overview

ServeFlow AI is a modern, AI-powered service marketplace platform that connects customers with service providers through intelligent request analysis, real-time communication, and transparent financial workflows.

The system is designed as a **production-ready, event-driven platform** rather than a prototype, with emphasis on:

- Resilient AI integrations
- Real-time UX
- Multi-role system design
- Scalable backend architecture

2. Technology Stack

Backend

- **Framework:** Django REST Framework (DRF)
- **Real-Time Layer:** Django Channels + Redis
- **Database:** SQLite3 (current), schema designed for PostgreSQL migration
- **AI Engine:** Google Gemini Pro Vision (google-generativeai SDK)
- **Authentication:** DRF Token Authentication (HTTP + WebSocket)
- **Email:** SMTP
- **Async & Events:** Signals + WebSocket event bus

Frontend

- **Framework:** React.js (Vite)
- **Styling:** Tailwind CSS + Custom Glassmorphism System
- **Animations:** Framer Motion
- **State Management:** Context API
- **Routing:** React Router DOM
- **HTTP Client:** Axios
- **Real-Time:** Native WebSocket integration via Context

3. Major Architectural Upgrades (Completed)

3.1 Production-Grade AI Intelligence Engine

Objective

Replace mock or static AI responses with a resilient, production-capable AI system.

Implementation

- Integrated **Google Gemini Pro Vision**
- Backend module:
`backend/api/views_ai.py`

Key Capabilities

- **Visual Request Analysis**
 - Accepts image uploads (multipart / base64)
 - Sends image + contextual prompt to Gemini Vision
 - Returns structured JSON:
 - Category
 - Technical title
 - Description
 - Urgency level
 - Estimated budget
- **Multi-Key Resilience System**
 - `SystemSettings` model stores **multiple independent API keys**
 - Automatic key rotation on 429 rate-limit errors
- **Graceful Degradation**
 - If all AI keys fail, system falls back to simulated AI output
 - Prevents request failure and preserves UX continuity

Status: ☐ Completed & Production-Ready

3.2 Real-Time Event Bus (WebSocket Ecosystem)

Objective

Eliminate HTTP polling and move to a fully event-driven architecture.

Infrastructure

- Django Channels
- Redis (`channels_redis`) as channel layer
- Supports fan-out and scalable real-time messaging

Security

- Custom `TokenAuthMiddleware`
- DRF token validation for WebSocket connections

Communication Channels

- `ws/notifications/`
 - Global notifications
 - Job offers
 - Status updates
 - System alerts
- `ws/chat/<job_id>/`
 - Isolated provider–customer chat rooms
 - Message persistence

Frontend Integration

- `WebSocketContext.jsx`
 - Centralized connection handling
 - Auto-reconnect strategy
 - Global state dispatch

Status: ☐ Completed

3.3 UI / UX Overhaul (Glassmorphism System)

Objective

Upgrade from a functional UI to a premium, modern product experience.

Global Design System

- Implemented in `index.css`
- Core utilities:
 - `.glass, .glass-card`
 - Backdrop blur
 - Semi-transparent layered panels

Animation System

- Custom motion patterns:
 - `blob` (floating gradients)
 - `scale-in` (modal & card transitions)

Component Modernization

- Landing Page:
 - 3D hero section
 - Animated feature cards
- Dashboards:
 - `Dashboard.jsx`
 - `ProviderDashboard.jsx`
 - `AdminPanel.jsx`
- Navigation:
 - Scroll-aware transparent navbar

Status: ☐ Completed

4. Backend Core Modules

Module	Purpose	Status
Authentication	User / Provider / Admin roles	<input type="checkbox"/> Complete
Request Engine	Service lifecycle management	<input type="checkbox"/> Complete
AI Service	Request & dispute analysis	<input type="checkbox"/> Complete
Matching System	Bid-based provider matching	<input type="checkbox"/> Complete
Financials	Invoices & commissions	<input type="checkbox"/> Partial
Messaging	Real-time chat	<input type="checkbox"/> Complete
Notifications	Email + UI alerts	<input type="checkbox"/> Complete
Audit Logs	Security & traceability	<input type="checkbox"/> Complete

5. Frontend Feature Modules

5.1 Mission Control – Provider Dashboard

File

- `frontend/src/pages/ProviderDashboard.jsx`

Core Concepts

- Jobs treated as “**Missions**”
- State machine:
 - Pending → Initiated → Completed
- Embedded real-time chat
- Live statistics engine:
 - Trust rating
 - Revenue
 - Mission success rate

Status: ☐ Completed

5.2 Intelligent Admin Control Panel

Files

- `AdminSettings.jsx`
- `AdminCategories.jsx`

Key Features

- Live theme & color preview
- Service category management with image previews
- Secure AI key vault (multi-key management)

Status: ☐ Completed

5.3 AI-Assisted Visual Request Creation

File

- `frontend/src/pages/CreateRequest.jsx`

Workflow

1. User uploads an image
2. AI analyzes the issue
3. System auto-fills:
 - Title
 - Description
 - Category
4. Backend maps AI output to internal category IDs

Impact

- Reduced user friction
- Higher-quality requests
- Faster provider matching

Status: ☐ Completed

6. Recent Sprint: Stability & Bug Fixes

Delivered Fixes

- Auth-aware navbar logic
- Branding & SEO consistency
- Footer icon import issues
- Admin save-flow repairs
- Image preview normalization
- Provider dashboard crash prevention
- Profile image uploads via `FormData`
- Notification triggers verified

Status: ☐ Completed

7. Gap Analysis (Current)

Feature	Status	Notes
Core Job Loop	Completed	End-to-end operational
Real-Time Chat	Completed	Persistent + secure
Visual Design	Completed	Glassmorphism system
Payments	Pending	Stripe integration planned
Dockerization	Planned	Dockerfile + compose

8. Overall Project Status

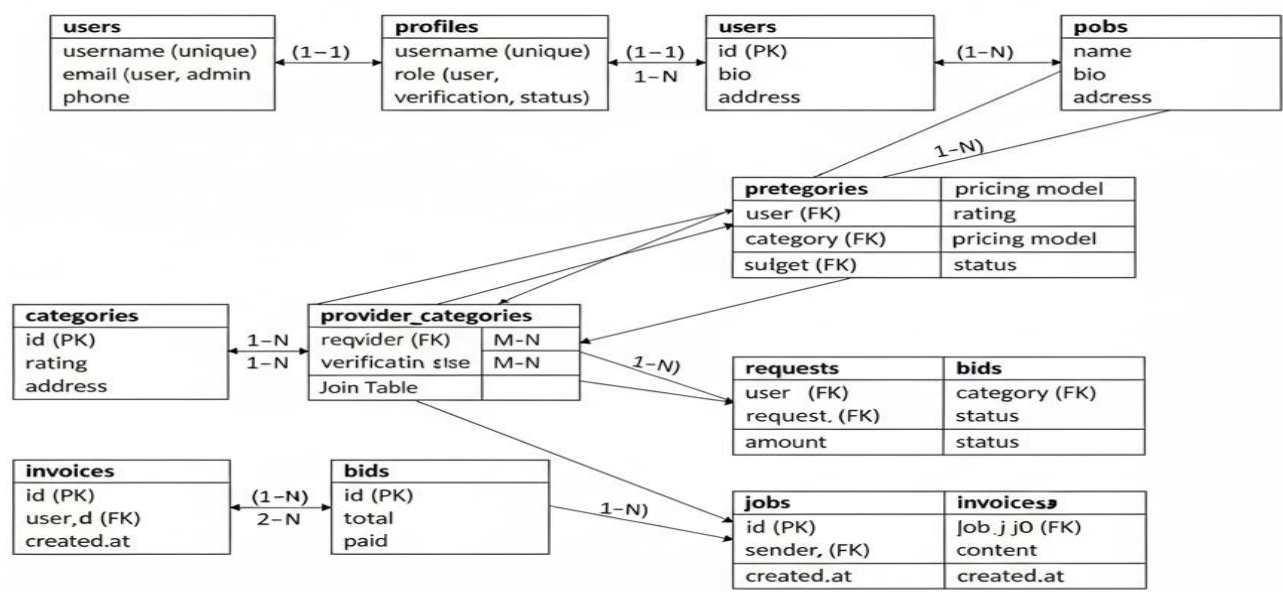
ServeFlow AI has moved beyond prototype stage.

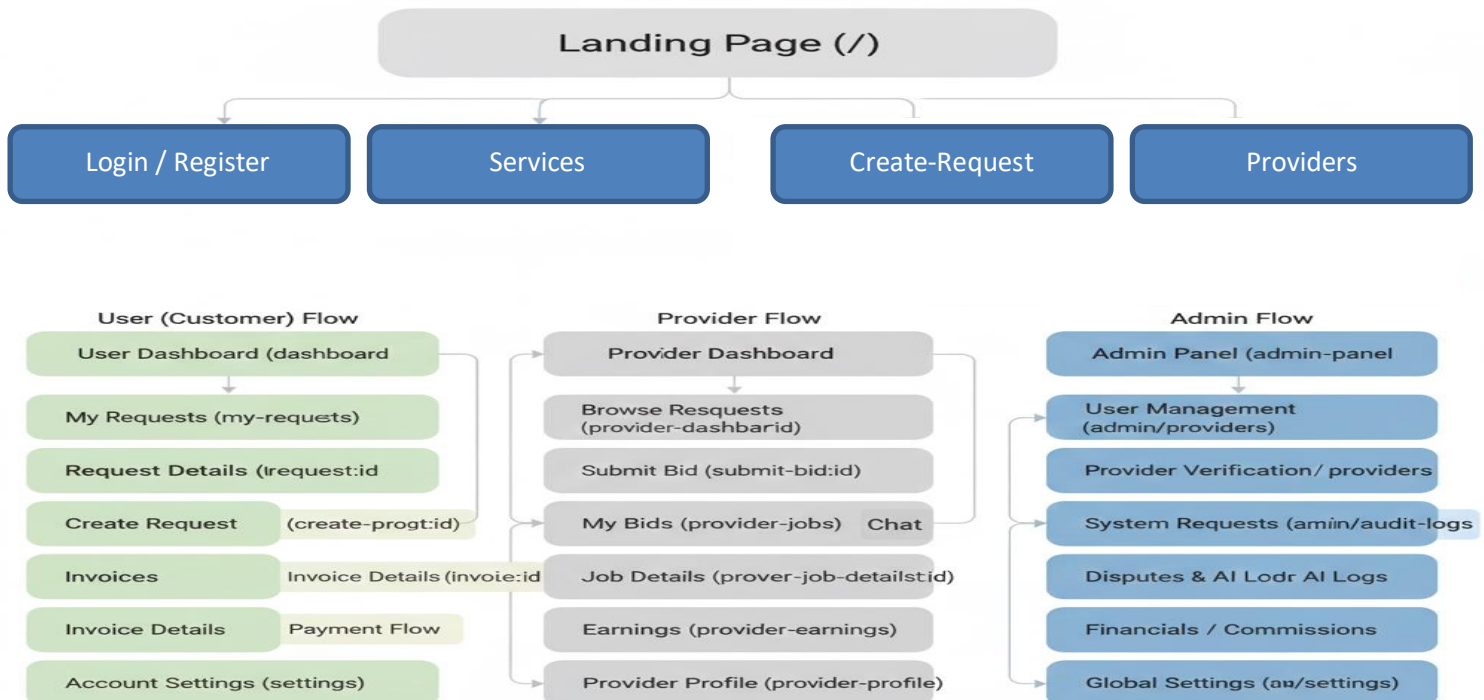
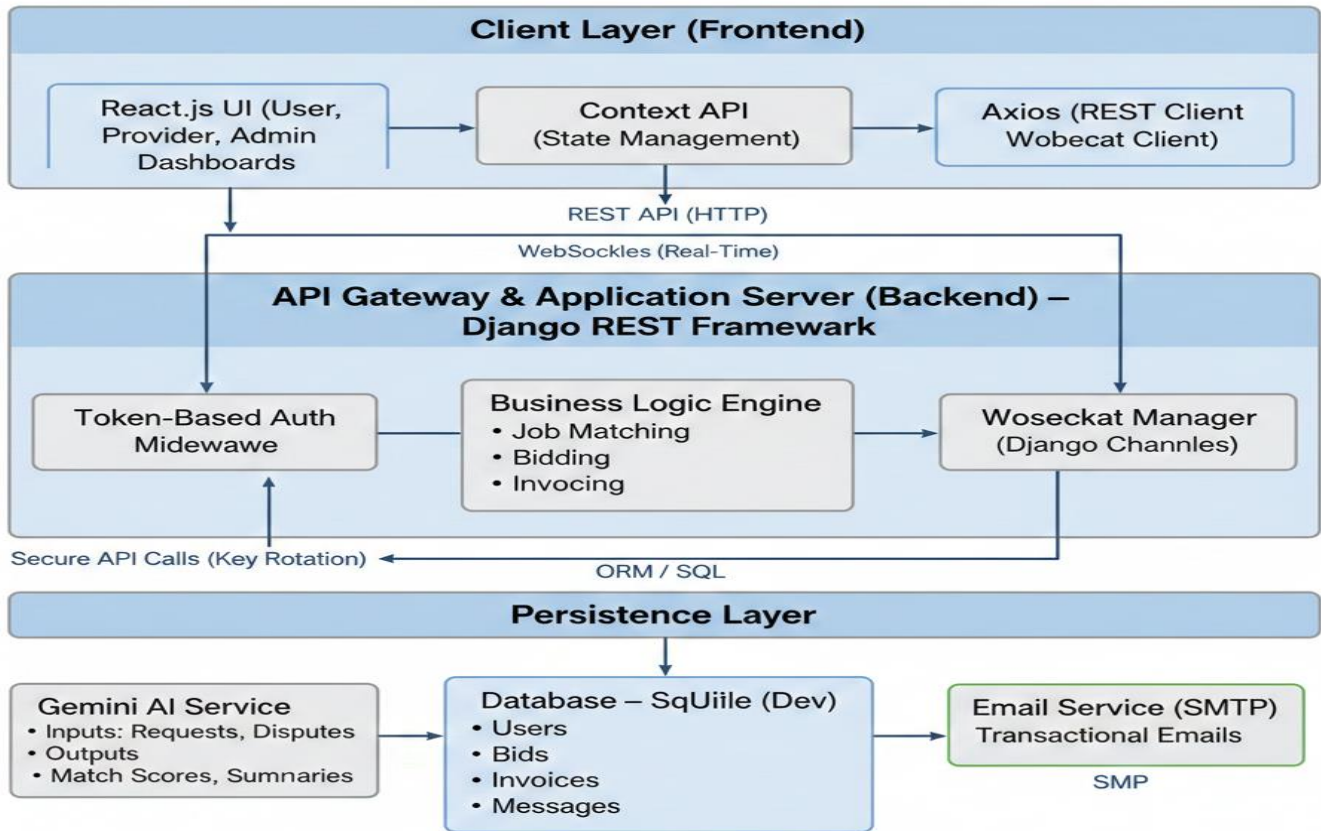
The platform now has:

- **A real AI engine**
- **Event-driven real-time UX**
- **Multi-role dashboards**
- **Production-grade architecture decisions**

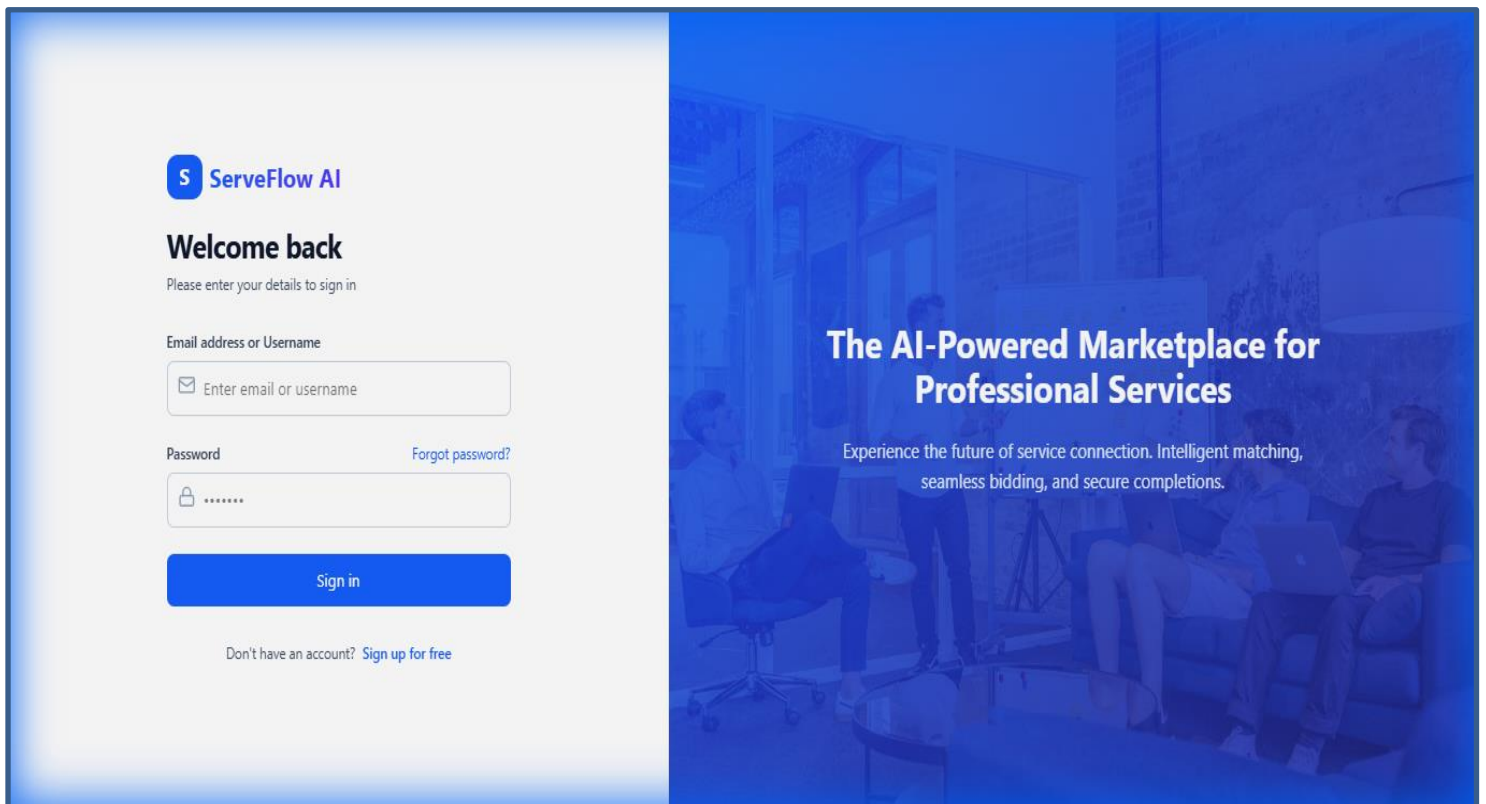
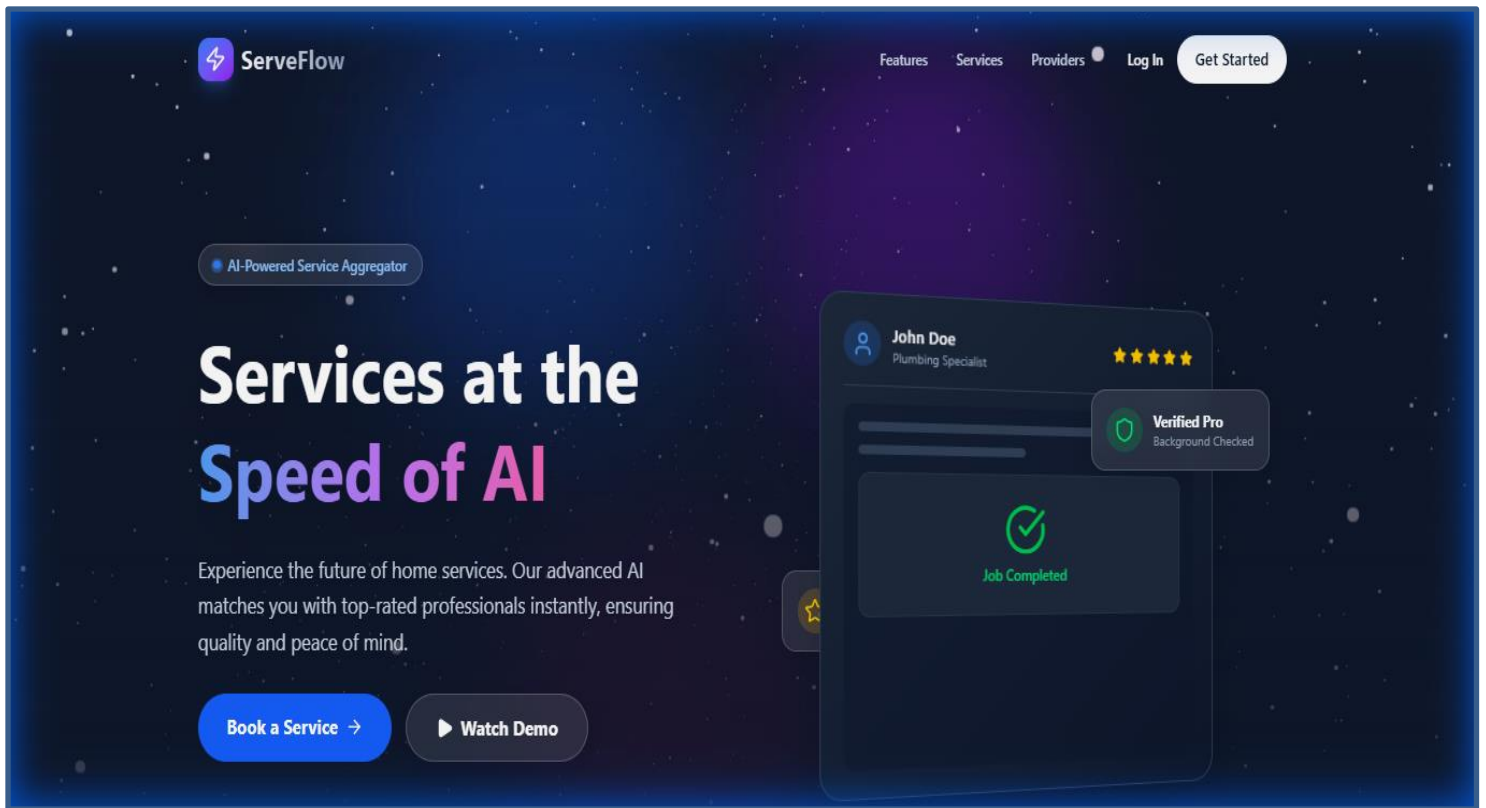
Remaining work is **infrastructure hardening**, not core system design.

DIAGRAMS






SCREENSHOTS



Create Account


Join our AI-powered service platform

I want to register as:



Customer

Request services



Provider

Offer services

First Name *

Last Name *

Username *

Email *

Phone (Optional)

Password *

ServeFlow AI

AI CORE POWERED

NAVIGATION HUB

Command Center

MANAGEMENT

Client Base

Service Force

Market Specs

SYSTEM PROTOCOLS

Live Bids

System Jobs

Terminate Session

ADMIN

PROTOCOL ACTIVE

Command Center

Global infrastructure management and protocol oversight

CLIENT BASE

7

SERVICE FORCE

2

ACTIVE JOBS

8

NET REVENUE

PKR130

VERIFICATION QUEUE

0 PENDING BOTS

SYSTEM HEALTH

GLOBAL API

NOMINAL

AI DIAGNOSTICS

ACTIVE

NEW SPEC

LIVE FLOW

All entities successfully verified.

VIEW ENTIRE FORCE ARCHIVE

ServeFlow AI
AI CORE POWERED

NAVIGATION HUB

Job Center

Active Orders

System Settings

Terminate Session

PROVIDER
PROTOCOL ACTIVE

Execution Hub
Managing active missions and performance metrics

TOTAL MISSIONS
3

SUCCESSFUL ENDS
2

TOTAL REVENUE
\$810

TRUST RATING
2.50

AVAILABLE MISSIONS

ID #9
Protocol Implementation
COMPLETED
MATCH: % INITIATED: 12/31/2025

ID #7
Protocol Implementation
ACCEPTED
MATCH: % INITIATED: 12/31/2025

Provider Session
Status: Encrypted

STATUS
Online & Ready

3 POTENTIAL TASKS

ServeFlow AI
AI CORE POWERED

NAVIGATION HUB

Overview

My Requests

Schedule AI Diagnostic

Billing & Invoices

User Reviews

Profile Settings

Terminate Session

DASHBOARD
PROTOCOL ACTIVE

System Status
Monitoring your service ecosystem in real-time

TOTAL DEPLOYMENTS
5

ACTIVE PROTOCOLS
0

VALIDATED RESULTS
4

OPERATION CENTER

Initialize New Request
Launch AI-powered service diagnostics

Deployment History
Monitor active protocols and logs

Live Efficiency Metrics
System performance is currently optimal with 99.9% uptime across all active nodes.

User Session
Status: Encrypted

New Request

S

ServeFlow AI

AI CORE POWERED

NAVIGATION HUB

Command Center

MANAGEMENT

Client Base

Service Force

Market Specs

SYSTEM PROTOCOLS

Live Birds

→ Terminate Session

USERS

PROTOCOL ACTIVE

Admin Session

Status: Encrypted

Users Management

Manage all platform users

All

Admin

Provider

User

ID	Username	Email	Role	Status	Joined	Actions
#1	admin	admin@example.com	admin	Active	12/4/2025	<div></div> <div></div>
#2	Admin	codewithtaha.mentor@gmail.com	admin	Active	12/4/2025	<div></div> <div></div>
#3	taha	noreply@ecommerce.com	user	Active	12/7/2025	<div></div> <div></div>
#4	company123	compay123@gmail.com	provider	Active	12/7/2025	<div></div> <div></div>
#5	test_provider_debug	p@debug.com	provider	Active	12/8/2025	<div></div> <div></div>
#7	electricpro	electric@pro.com	provider	Active	12/10/2025	<div></div> <div></div>

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AI CORE POWERED

NAVIGATION HUB

Command Center

MANAGEMENT

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Market Specs

SYSTEM PROTOCOLS

Live Birds

→ Terminate Session

PROVIDERS

PROTOCOL ACTIVE

Admin Session

Status: Encrypted

Provider Management

Verify and manage service providers

Search providers...

⌵

All Providers

S

Smart Solutions

@company123

VERIFIED

No bio provided.

Rating0.00★

Completed Jobs0

Total Earnings\$0.00

Manage

View Profile

⊗

J

John Electrician

@electricpro

VERIFIED

No bio provided.

Rating2.50★

Completed Jobs0

Total Earnings\$0.00

Manage

View Profile

⊗

S

ServeFlow AI

AI CORE POWERED

NAVIGATION HUB

Command Center

MANAGEMENT

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Market Specs

SYSTEM PROTOCOLS

Live Bids

Terminate Session

CATEGORIES

PROTOCOL ACTIVE

Admin Session
















Status: Encrypted

Service Categories

Manage available services and pricing

+ Create New Category

Search categories...

Name	Pricing Model	Base Price	Status	Actions
 Plumbing	Hourly	\$50.00	Active	 
 Electrical	Hourly	\$50.00	Active	 
 Cleaning	Hourly	\$50.00	Active	 
 Carpentry	Hourly	\$50.00	Active	 
 Painting	Hourly	\$50.00	Active	 

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ServeFlow AI

AI CORE POWERED

MANAGEMENT

Client Base

Service Force

Market Specs

Live Bids

System Jobs

Global Config

Terminate Session

REQUESTS

PROTOCOL ACTIVE

Admin Session






Status: Encrypted

Service Requests

Manage and monitor all user service requests

Search requests...

All Status

ID	TITLE	STATUS	USER	DATE	ACTIONS
#8	Urgent Plumbing Repair Needed	completed	taha	12/31/2025	
#7	Urgent Plumbing Repair Needed	assigned	taha	12/31/2025	
#6	clean my office	completed	taha	12/11/2025	
#5	my electricity is flickering	completed	taha	12/10/2025	
#3	fix my kitchen sink water leakage	completed	taha	12/7/2025	

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ServeFlow AI

AI CORE POWERED

NAVIGATION HUB

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MANAGEMENT

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Market Specs

SYSTEM PROTOCOLS

Live Bids

Terminate Session

JOBS

PROTOCOL ACTIVE

Admin Session

Status: Encrypted

Jobs Management

Monitor and manage all jobs

All

Pending

Accepted

Started

Completed

Cancelled

Pending

1

Accepted

1

Started

0

Completed

4

Cancelled

1

Job ID	Request	Customer	Provider	Status	Budget	Created	Actions
#9	Urgent Plumbing Repair Needed	taha	electricpro	completed	\$800.00	12/31/2025	View
#8	Urgent Plumbing Repair Needed	taha	company123	pending	\$800.00	12/31/2025	View
#7	Urgent Plumbing Repair Needed	taha	electricpro	accepted	\$800.00	12/31/2025	View
#6	Urgent Plumbing Repair Needed	taha	company123	cancelled	\$800.00	12/31/2025	View
#5	clean my office	taha	electricpro	completed	\$100.00	12/11/2025	View

S

ServeFlow AI

AI CORE POWERED

NAVIGATION HUB

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SYSTEM PROTOCOLS

Live Bids

System Jobs

Terminate Session

SETTINGS

PROTOCOL ACTIVE

Admin Session

Status: Encrypted

System Settings

Command center for platform-wide logic and aesthetics

Platform

Payments

AI & Features

Mail Server

Revenue

Appearance

General Platform

Manage public identity and basic info

Platform Name

ServeFlow AI

Support Email

support@serveflow.ai

CURRENCY & DISPLAY

Symbol

PKR

Maintenance Mode

When active, only administrators can access the platform.

Platform is Online