

WhatsAppMeta

Twilio SMS Webhook System with Job Queue & Session Management

Project Overview

Built a production-grade messaging automation system using Twilio webhooks and Node.js/Express. The system routes incoming messages to appropriate handlers, manages user sessions across conversations, and processes jobs through a worker pool with real-time status tracking.

Key Achievement: Architecture maps directly to WhatsApp Business API integration patterns - same webhook model, session management, and job routing.

Architecture

```
Message In → Twilio Webhook → Express Server → Route Handler ↓ Session Manager ↓ Job Queue (Worker Pool) ↓ State Machine (pending → running → completed) ↓ Response → Twilio → User
```

Technical Implementation

Webhook Architecture

- Twilio signature validation for security
- Express middleware for request parsing
- Phone number whitelist authentication
- Rate limiting to prevent abuse

Job Queue System

- Worker pool with 4 concurrent workers
- 5-second polling interval
- State machine: pending → running → completed/failed
- Database-backed job persistence

Session Management

- Cross-conversation session tracking
- Pagination for long responses
- Session timeout handling
- Context preservation across messages

Tech Stack

Backend: Node.js, Express.js, TypeScript

Database: SQLite/PostgreSQL with WAL mode

Messaging: Twilio API

Logging: Winston

Testing: Jest (27 test files)

Skills Demonstrated

Node.js

Express.js

Twilio API

PostgreSQL

Webhook Architecture

Job Queues

State Machines

REST API

Authentication

Real-time Dashboard

Deliverables

- Twilio webhook integration with signature validation

- Job queue system with 4-worker pool
- Session management across message threads
- State machine for job status tracking
- Real-time admin dashboard
- Comprehensive test suite (27 test files)
- Production logging and error handling
- Graceful shutdown handling

Why This Matters

This project demonstrates deep understanding of messaging API integration patterns. The architecture (webhook ingestion → session management → job routing → status tracking → response) is the exact pattern required for WhatsApp Business API implementations, service marketplaces, and chatbot systems.