

# WhatsAppMeta

Twilio SMS Webhook System with Job Queue & Session Management

## Project Overview

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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

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

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### 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

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**Backend:** Node.js, Express.js, TypeScript

**Database:** SQLite/PostgreSQL with WAL mode

**Messaging:** Twilio API

**Logging:** Winston

**Testing:** Jest (27 test files)

## Skills Demonstrated

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Node.js

Express.js

Twilio API

PostgreSQL

Webhook Architecture

Job Queues

State Machines

REST API

Authentication

Real-time Dashboard

## Deliverables

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- 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

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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.