SS7 HA Gateway - Project Brief

Project Description

SS7 HA Gateway is an open-source, carrier-grade protocol handling layer designed for SS7/MAP/CAP networks. It serves as a bridge between legacy telecom infrastructure (HLR, MSC, VLR) and modern application ecosystems.

The gateway provides high availability through distributed state management using Redis and implements an event-driven architecture by publishing clean JSON events to Kafka. This allows modern applications to interact with SS7 networks without needing complex SS7 stack knowledge.

Who is this library for?

This library is designed for a wide range of stakeholders in the telecommunications industry:

- Telecom Operators & Carriers: For modernizing legacy infrastructure and exposing services via modern APIs.
- Mobile Virtual Network Operators (MVNOs): To implement core network services efficiently.
- Value-Added Service (VAS) Providers: Companies building SMS Centers (SMSC), USSD gateways, or Location Based Services (LBS).
- FinTech & Authentication Providers: For delivering OTPs and 2FA services via reliable SMS channels.
- Software Developers: Who need to integrate with SS7 networks using familiar tools like Kafka and JSON, avoiding the steep learning curve of SS7 protocols.

Key Advantages

The SS7 HA Gateway offers several significant benefits:

1. High Availability & Reliability:
   Utilizes Redis Cluster for distributed dialog state management, ensuring continuous operation even if a gateway node fails. It guarantees sub-15-second failover and zero message loss.

2. Scalability:
   Built for horizontal scalability. You can simply add more gateway instances to handle increased load, supporting 50,000+ dialogs per second per instance.

3. Modern Event-Driven Architecture:
   Decouples the complex SS7 layer from business logic. Applications consume standard JSON events from Kafka, enabling integration in any programming language (Java, Python, Node.js, etc.).

4. Cost-Effective & Open Source:
   Reduces reliance on expensive proprietary hardware and software. It runs on standard commodity hardware or containerized environments (Docker/Kubernetes).

5. Ease of Operations:
   Includes comprehensive monitoring with Prometheus metrics, health checks, and structured logging, making it production-ready out of the box.