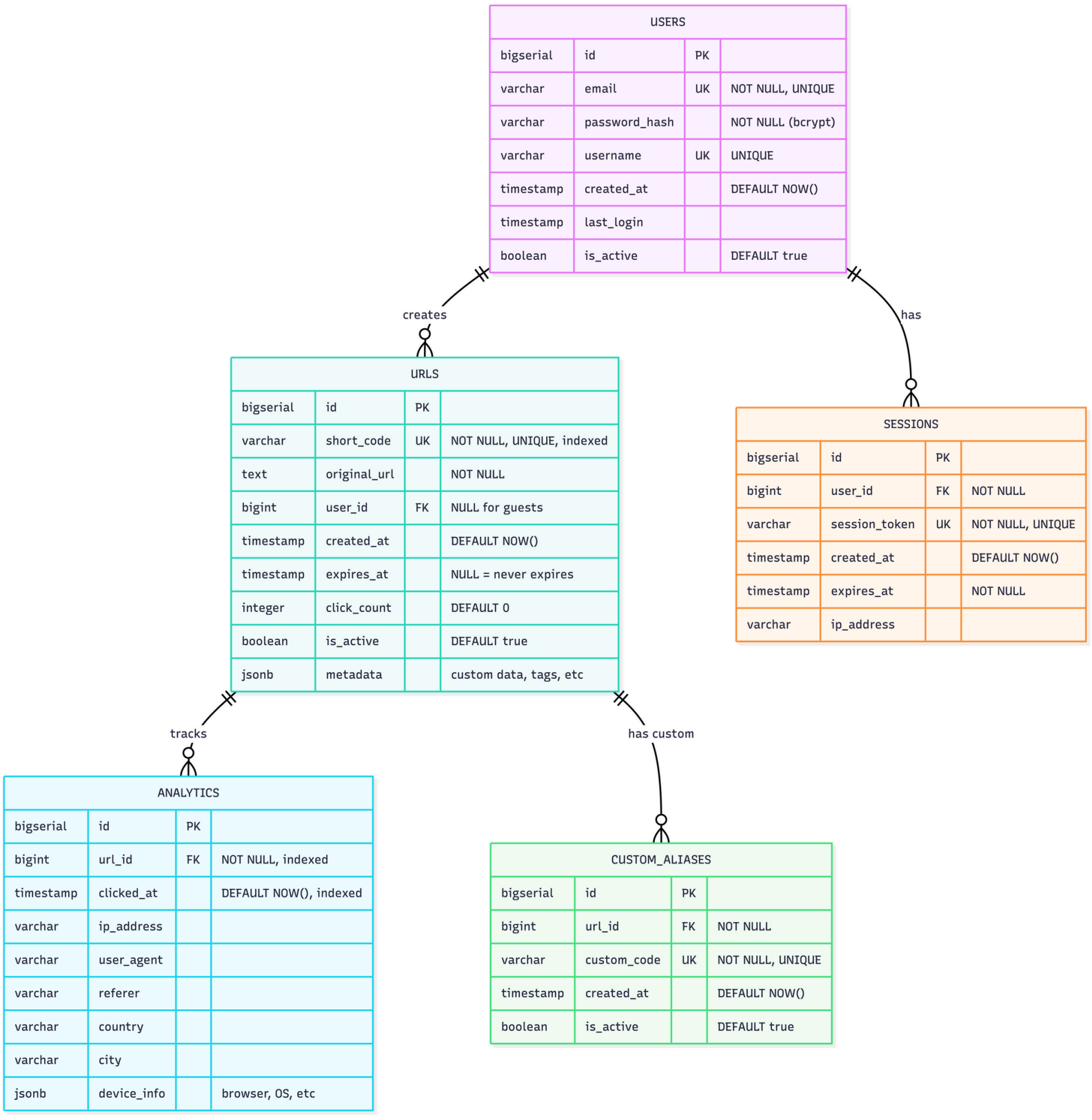
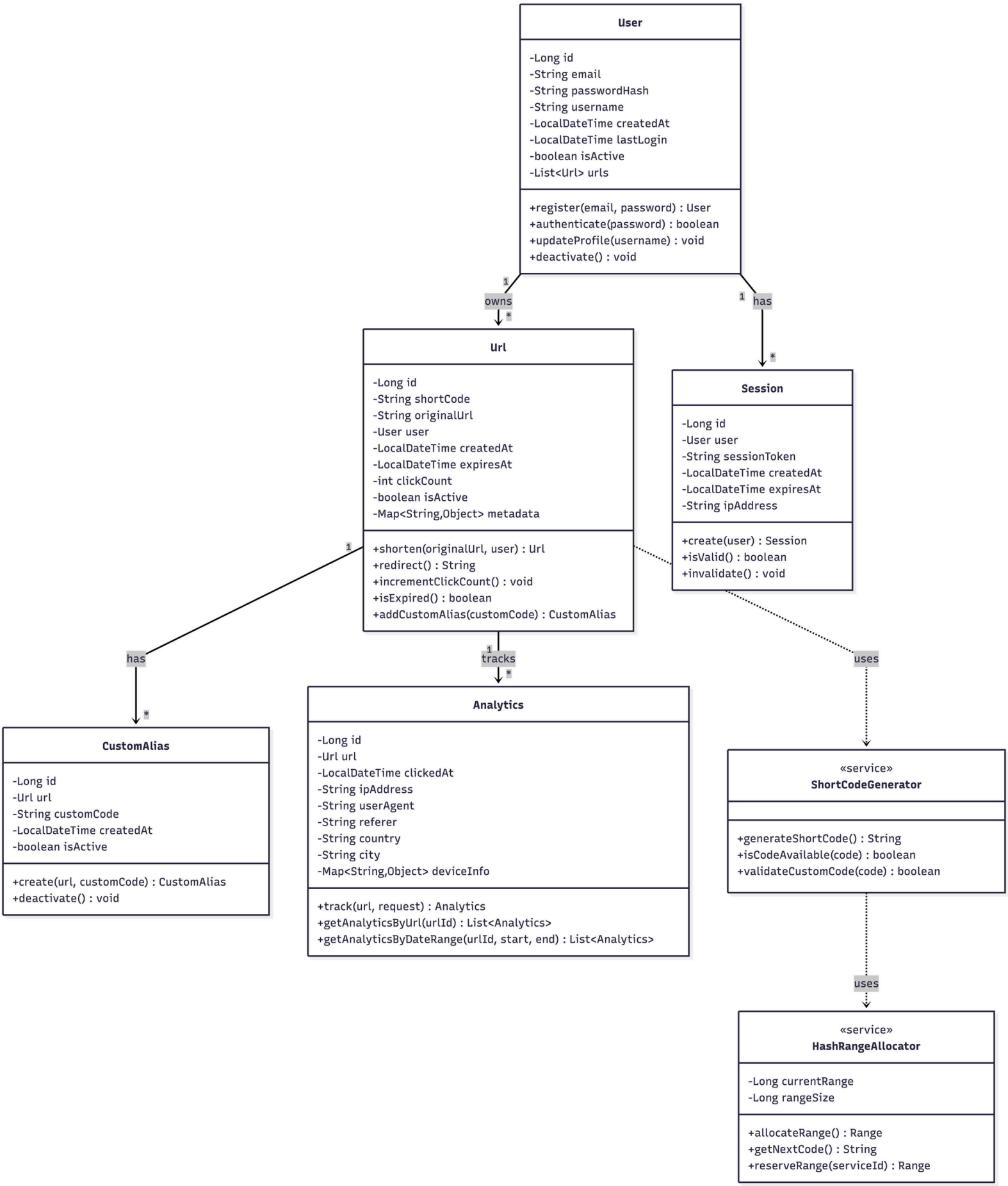
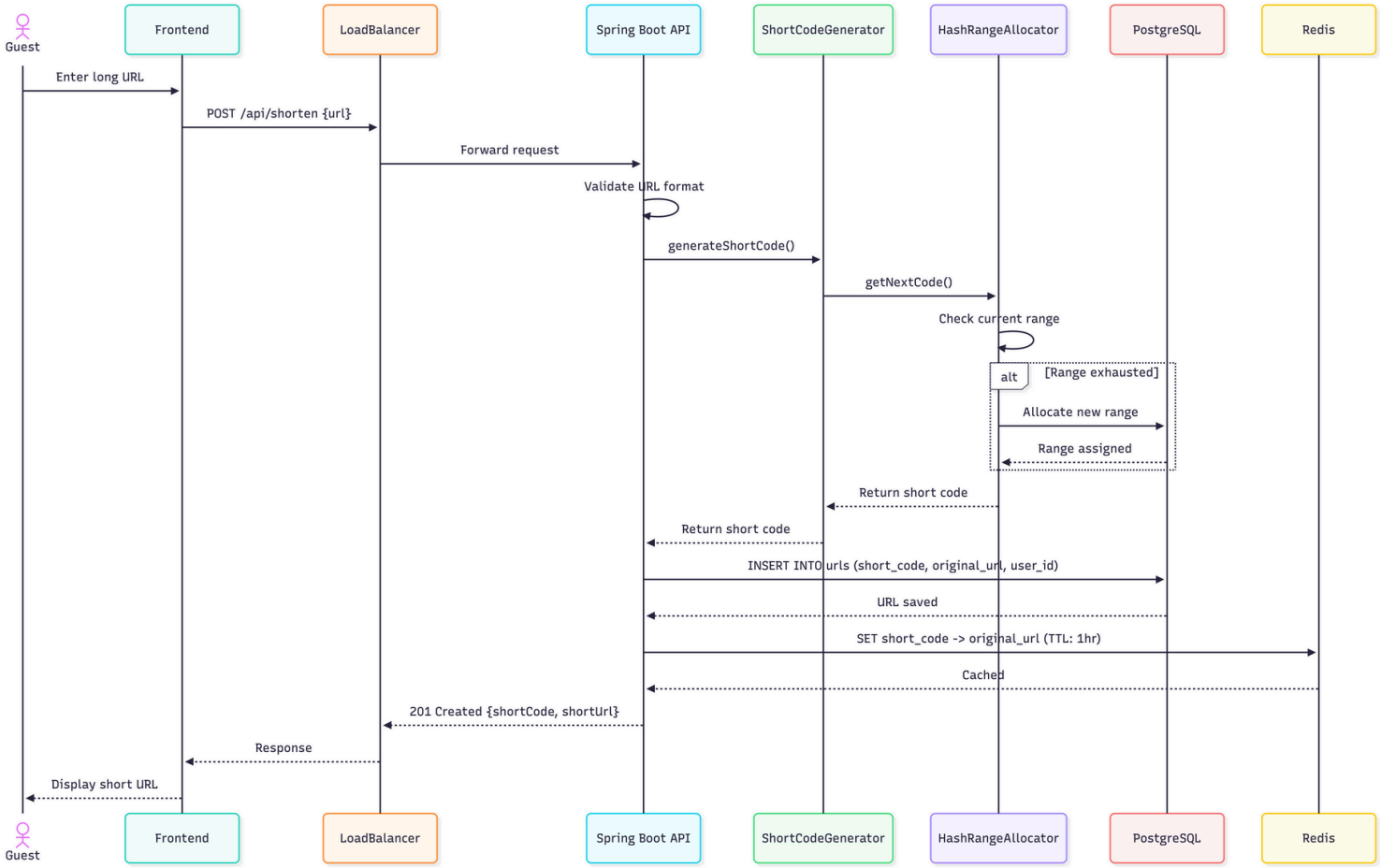
URL SHORTENER – DATABASE SCHEMA (ER DIAGRAM)



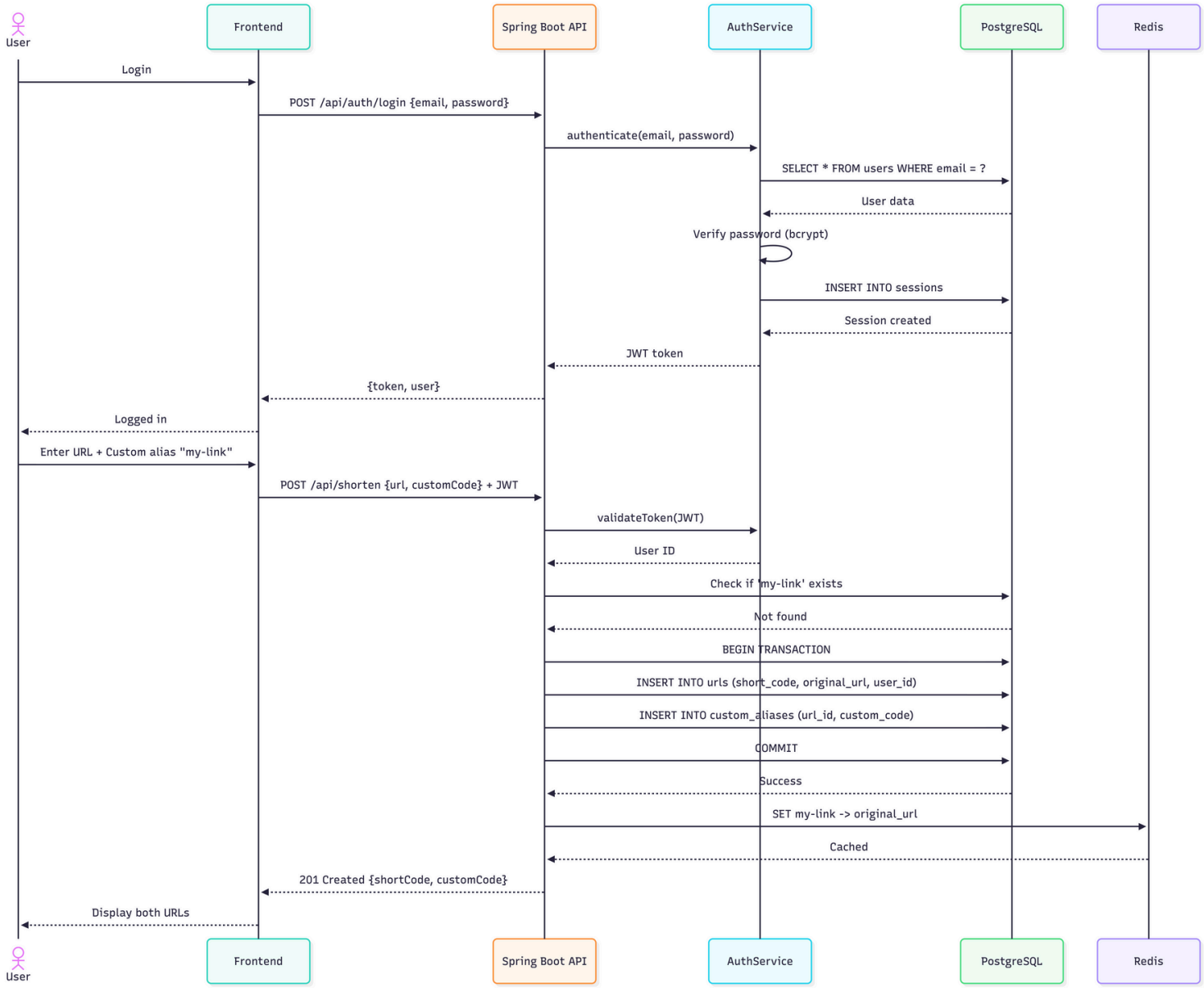
CLASS DIAGRAM – BACKEND DOMAIN MODEL



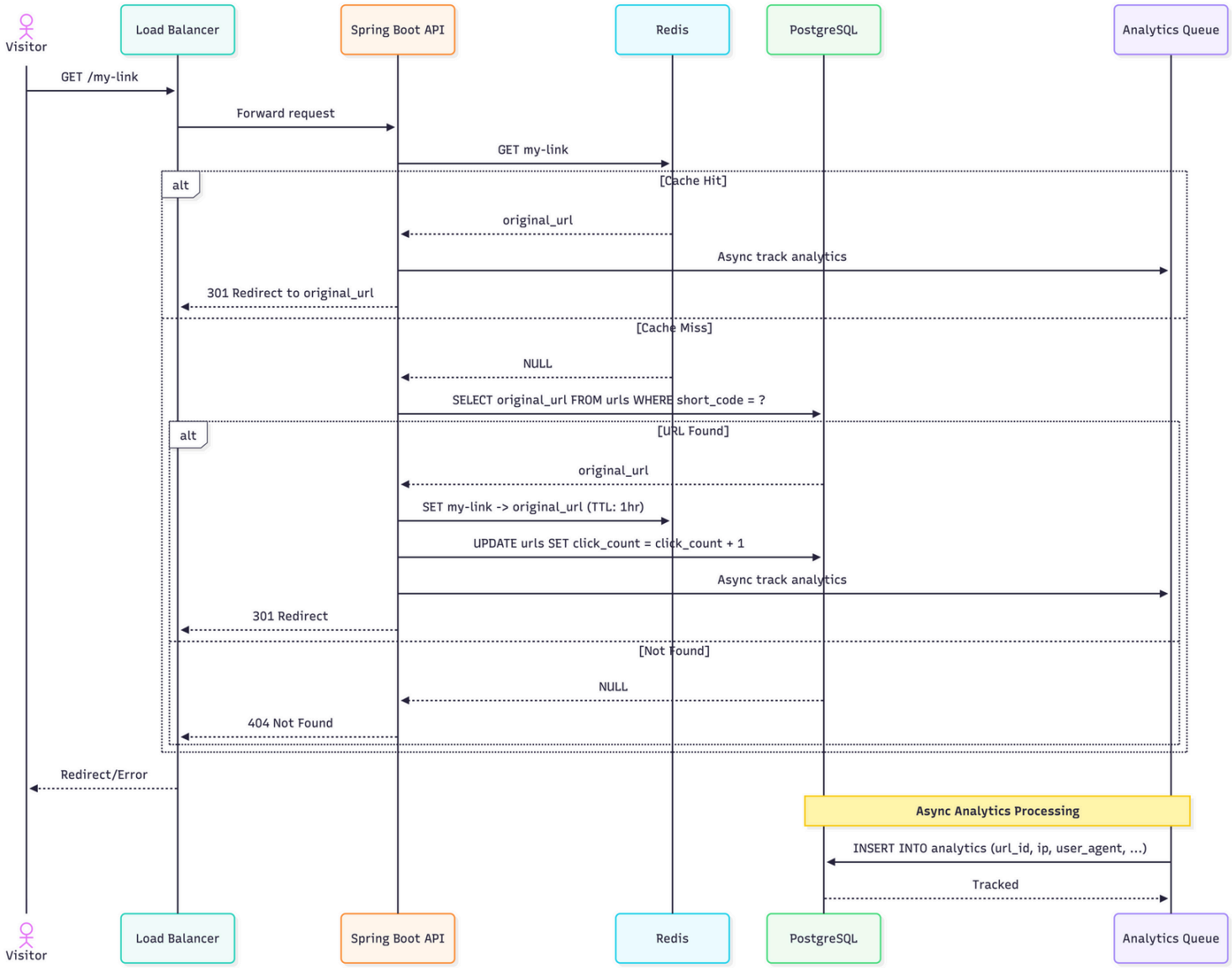
SEQUENCE DIAGRAM – GUEST SHORTENING URL



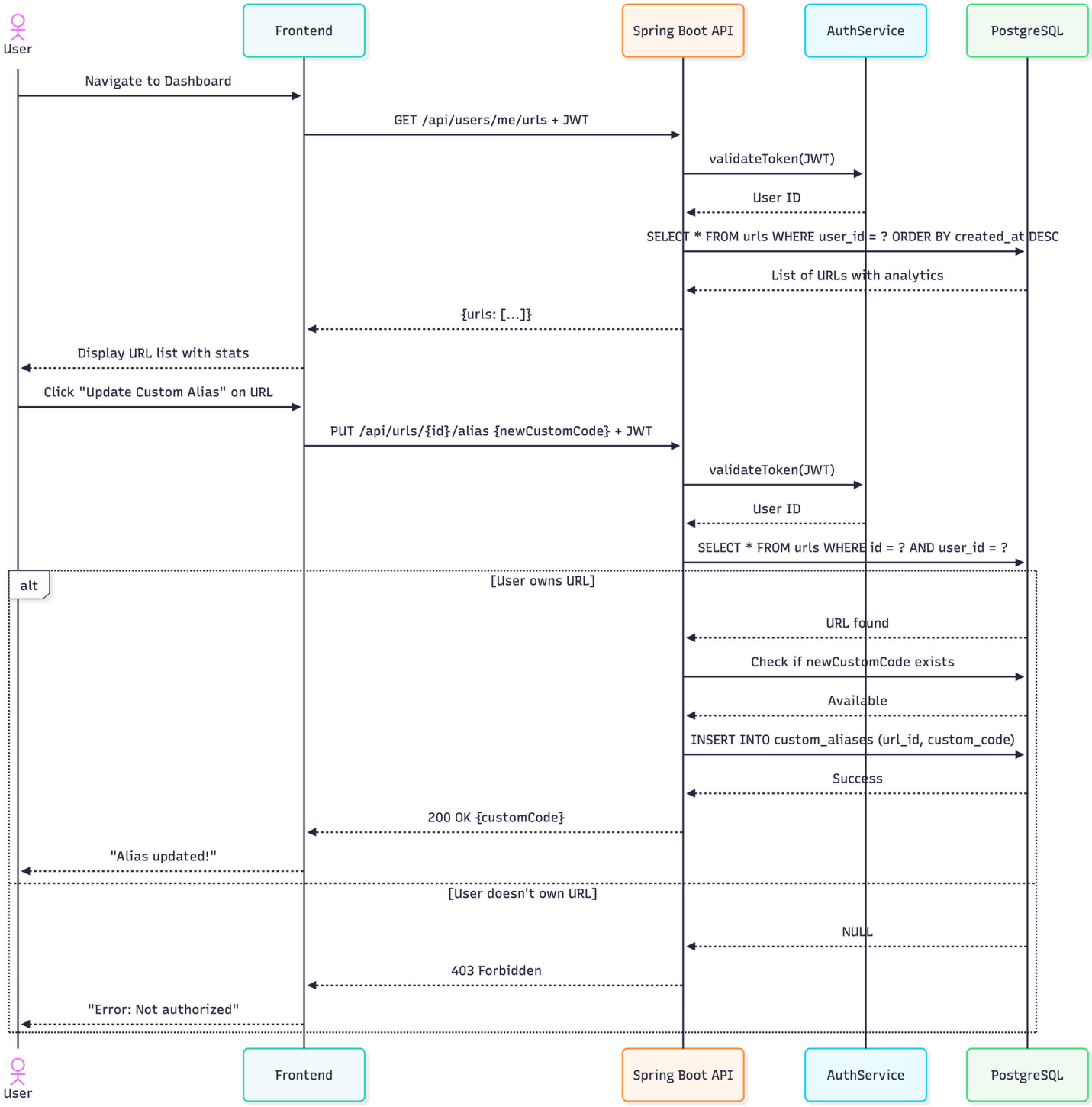
SEQUENCE DIAGRAM – USER WITH CUSTOM ALIAS



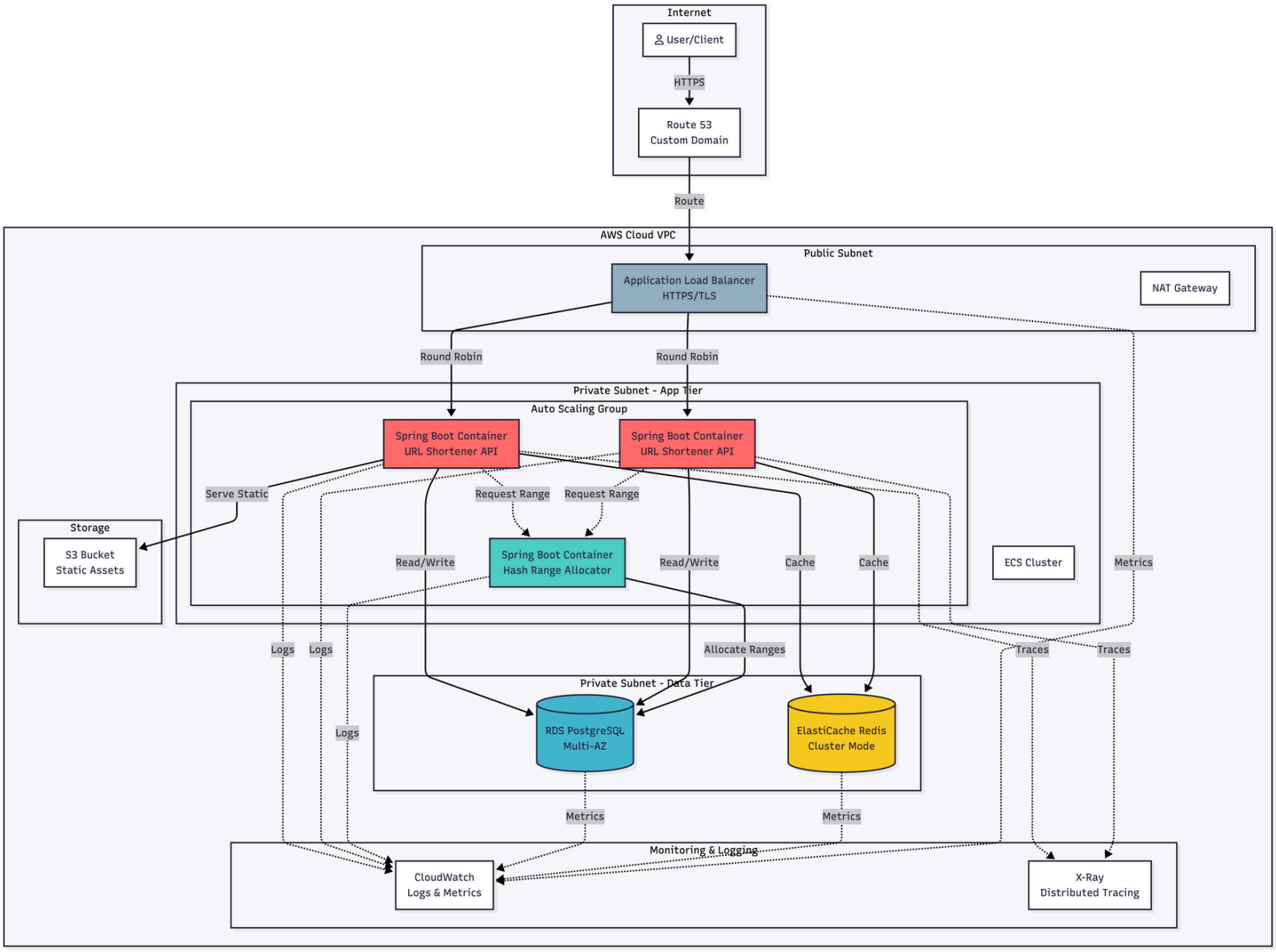
SEQUENCE DIAGRAM – URL REDIRECT



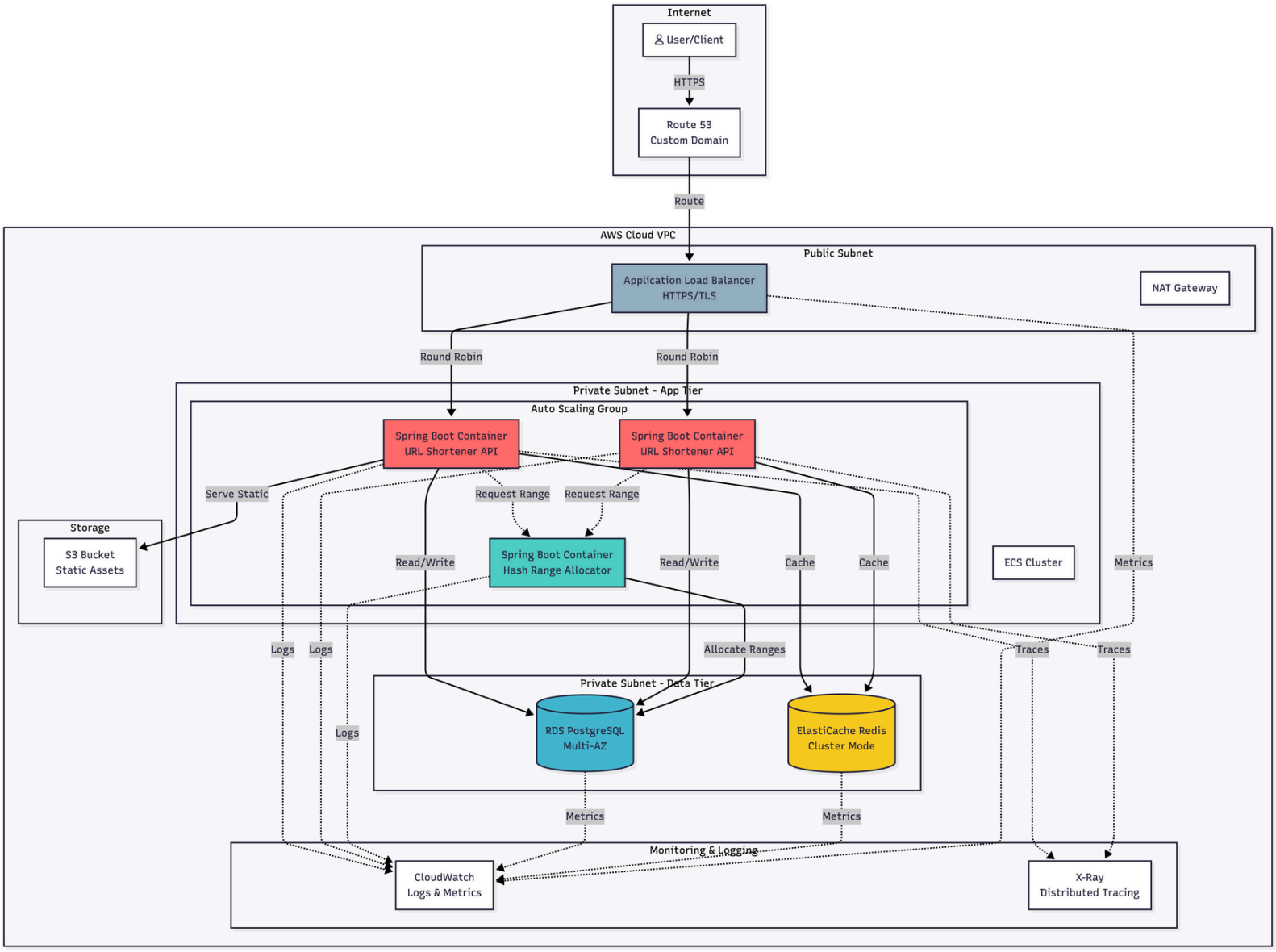
SEQUENCE DIAGRAM – USER MANAGES URLS



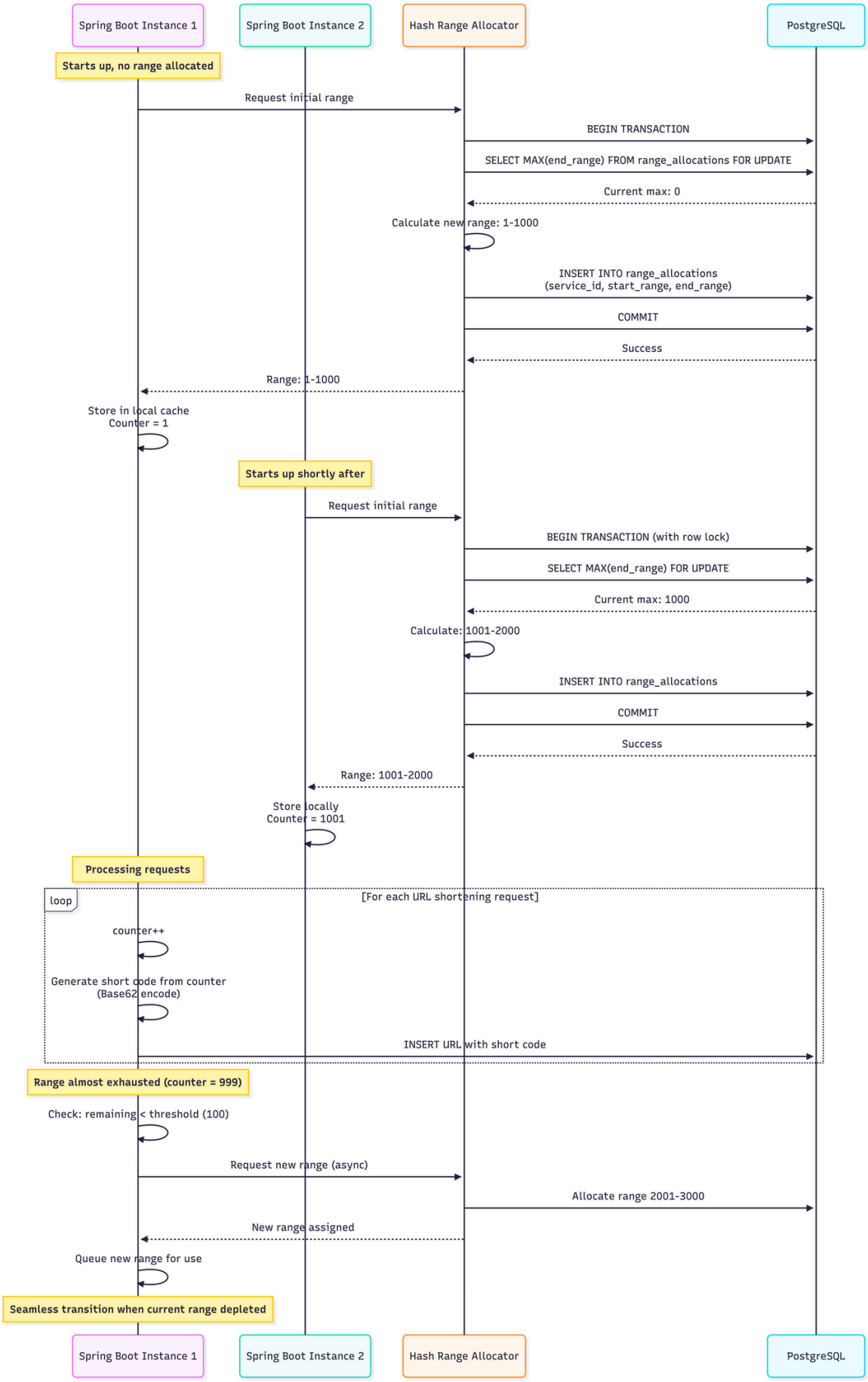
AWS ARCHITECTURE DIAGRAM



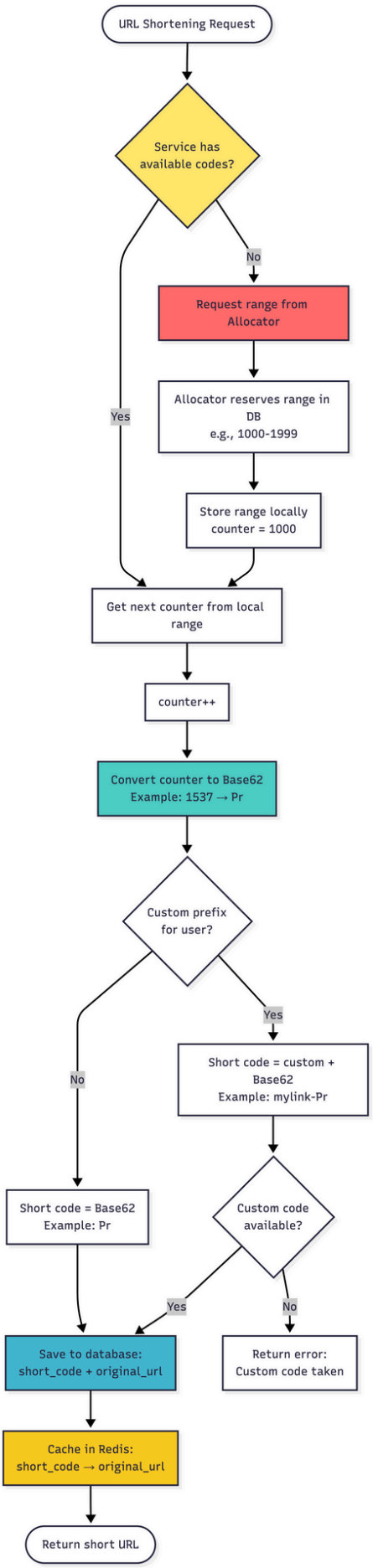
HASH RANGE ALLOCATOR – DETAILED DESIGN



HASH RANGE ALLOCATION SEQUENCE



SHORT CODE GENERATION ALGORITHM



DATABASE DESIGN – RANGE ALLOCATIONS

RANGE_ALLOCATIONS			
bigserial	id	PK	
varchar	service_instance_id	UK	Container/Instance ID
bigint	start_range		Start of allocated range
bigint	end_range		End of allocated range (inclusive)
timestamp	allocated_at		DEFAULT NOW()
timestamp	expires_at		Optional: for cleanup
varchar	status		ACTIVE, EXHAUSTED, EXPIRED

GLOBAL_COUNTER			
int	id	PK	Always 1 (single row table)
bigint	current_counter		Atomic counter for next range
bigint	range_size		Default: 1000
timestamp	last_updated		