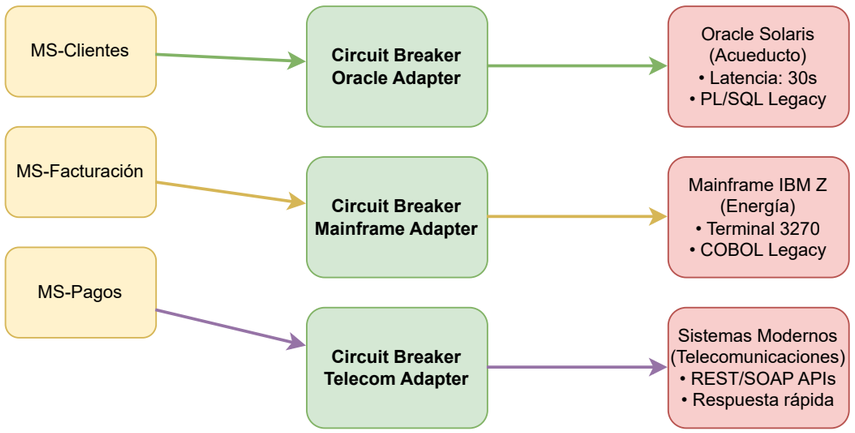
CIRCUIT BREAKER PATTERN - ADAPTADORES SISTEMAS LEGADOS



ESTADOS DEL CIRCUIT BREAKER

ESTADO: CERRADO (CLOSED)

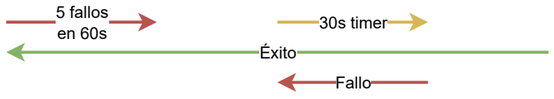
- Requests pasan normalmente
- Monitorea fallos
- Cuenta errores consecutivos
- Umbral: 5 fallos en 60s

ESTADO: ABIERTO (OPEN)

- Rechaza requests inmediatamente
- Retorna fallback/cache
- Timer: 30s antes de HALF_OPEN
- Evita cascading failures

ESTADO: MEDIO ABIERTO (HALF_OPEN)

- Permite 1 request de prueba
- Si éxito → CLOSED
- Si fallo → OPEN (30s más)
- Probe health del sistema



CONFIGURACIÓN RESILIENCE4J

Oracle Adapter Configuration:
- failureRateThreshold: 50%
- waitDurationInOpenState: 30s
- slidingWindowSize: 10
- minimumNumberOfCalls: 5
- permittedNumberOfCallsInHalfOpenState: 3
- slowCallDurationThreshold: 30s (PL/SQL timeout)

Mainframe Adapter Configuration:
- failureRateThreshold: 60%
- waitDurationInOpenState: 45s
- slidingWindowSize: 8
- minimumNumberOfCalls: 3
- slowCallDurationThreshold: 4s (3270 terminal)
- recordExceptions: TimeoutException, ConnectionException

ESTRATEGIAS DE FALLBACK

1. Cache Fallback:
- Retornar última consulta exitosa (TTL: 24h)
- Marcar datos como 'cached' con timestamp

2. Default Values:
- Saldo = 0 con mensaje 'No disponible'
- Status = 'MAINTENANCE'

3. Degraded Service:
- Funcionalidad limitada
- Solo lectura, no transacciones

4. Queue for Later:
- Encolar operaciones críticas
- Procesar cuando servicio se recupere

MONITOREO Y MÉTRICAS

Prometheus Metrics:
- resilience4j_circuitbreaker_state{name='oracle-adapter', state='open|closed|half_open'}
- resilience4j_circuitbreaker_calls_total{name='mainframe-adapter', kind='successful|failed|not_permitted'}
- resilience4j_circuitbreaker_call_duration{name='telecom-adapter'}

Grafana Dashboards:
- Circuit Breaker State por Adaptador • Failure Rate Trends • Response Time Percentiles
- Fallback Usage Statistics • System Recovery Times