Circuit Breaker & Resilience - Discussion Topics

Architecture & Design

1. **When should you use circuit breaker vs retry vs both?**
   - Transient vs persistent failures
   - Combining patterns effectively
   - Order of pattern application
2. **How do you determine the right failure threshold for a circuit breaker?**
   - Balancing sensitivity vs stability
   - Service-specific considerations
   - Monitoring and tuning approaches
3. **What are the trade-offs between thread pool isolation and semaphore-based bulkheads?**
   - Resource overhead
   - Timeout handling
   - Use cases for each approach

Real-World Scenarios

4. **Design resilience patterns for a payment processing system**
   - Which patterns are critical?
   - Fallback strategies for financial transactions
   - Idempotency considerations
5. **How would you handle a cascading failure in a microservices architecture?**
   - Detection and alerting
   - Automatic vs manual intervention
   - Recovery strategies
6. **What happens when your circuit breaker opens during peak traffic?**
   - Capacity planning implications
   - Fallback capacity requirements
   - User experience considerations

Implementation Challenges

7. **How do you test resilience patterns effectively?**
   - Chaos engineering approaches
   - Simulating failures in staging
   - Load testing with failure injection
8. **What metrics should you monitor for circuit breakers?**
   - State transitions
   - Failure rates and patterns
   - Latency distributions
9. **How do you handle circuit breaker state in a distributed system?**
   - Local vs shared state
   - Consistency across instances
   - Coordination challenges

Advanced Topics

10. **How do you implement graceful degradation without losing critical functionality?**
    - Feature prioritization
    - Partial response strategies
    - User communication during degradation
11. **What's the relationship between circuit breakers and rate limiting?**
    - Complementary patterns

- When to use each
- Combined implementation strategies

12. **How do you handle retry storms in a distributed system?**
    - Jitter strategies
    - Backpressure mechanisms
    - Coordinated retry policies