**Microservice Architecture Presentation**

**Slide 1: Title Slide**

**Banking System Microservice Architecture**

* Deployment Approaches and Recommendations
* April 2, 2025

**Slide 2: Agenda**

* Microservice Architecture Overview
* Service Decomposition
* Deployment Architecture Options
* Architecture Comparison
* Recommendations

**Slide 3: Microservice Architecture Overview**

**Three Core Microservices:**

* Deposit/Transaction Microservice
* Account Command Microservice
* Account Inquiry Microservice

**Slide 4: Service Decomposition**

**Deposit/Transaction Microservice:**

* Credit Operations
* Debit Operations
* Fund Transfers
* Earmarking
* Fee/Interest Calculations

**Slide 5: Service Decomposition (continued)**

**Account Command Microservice:**

* Account Opening
* Account Closure
* Status/Signal Updates
* Account Updates

**Account Inquiry Microservice:**

* Account Summary
* Transaction History
* Earmark Inquiry
* General Inquiries

**Slide 6: Deployment Architecture Options**

**Two approaches being considered:**

1. Standard Microservices with Distributed Database
2. Cell-Based Architecture

**Slide 7: Standard Microservices with Distributed DB**

**Architecture Overview:**

* Shared distributed database (sharded by account)
* Microservices deployed on OpenShift
* Database-level ACID transactions
* Vertical scaling of DB shards

**Slide 8: Standard Microservices - Diagram**

[Standard Microservices Architecture Diagram]

**Slide 9: Standard Microservices - Pros & Cons**

**Advantages:**

* Centralized data consistency
* Simplified deployment
* Efficient resource utilization
* Unified observability

**Challenges:**

* Potential single point of failure
* Performance bottlenecks
* Sharding complexity
* Limited account isolation

**Slide 10: Cell-Based Architecture**

**Architecture Overview:**

* Independent, self-contained cells
* Each cell has dedicated services and database
* Local transactions within cells, Saga pattern across cells
* Horizontal scaling by adding more cells

**Slide 11: Cell-Based Architecture - Diagram**

[Cell-Based Architecture Diagram]

**Slide 12: Cell-Based Architecture - Pros & Cons**

**Advantages:**

* Strong fault isolation (failure impacts ≤5% customers)
* Horizontal scalability
* Reduced blast radius
* Performance predictability

**Challenges:**

* Cross-cell data consistency
* Operational complexity
* Routing mechanism complexity
* Higher infrastructure costs

**Slide 13: Architecture Comparison**

| **Aspect** | **Standard Approach** | **Cell-Based Approach** |
| --- | --- | --- |
| System Organization | Single logical system | Independent cells |
| Scalability | Database sharding | Adding more cells |
| Fault Isolation | Limited | Strong (per cell) |
| Operational Complexity | Distributed transactions | Cell orchestration |
| Resource Efficiency | Higher | Lower (duplication) |

**Slide 14: Business Considerations**

**Key Decision Factors:**

* Customer base size and growth projections
* Regulatory requirements for data isolation
* Service level agreements and availability needs
* Development team capabilities
* Operational maturity

**Slide 15: Technical Considerations**

**Implementation Factors:**

* Development team experience
* Operational capabilities and monitoring
* Performance requirements for transactions
* Migration strategy from existing systems
* Long-term maintenance requirements

**Slide 16: Phased Approach**

**Possible Implementation Strategy:**

* Start with standard microservices architecture
* Evolve toward cell-based model as system matures
* Gradually migrate customers to cells
* Develop operational expertise along the way

**Slide 17: Recommendations**

**Based on Analysis:**

* For smaller deployments with stable growth: Standard approach
* For large-scale systems with high availability needs: Cell-based approach
* Consider hybrid approach for gradual evolution
* Evaluate based on specific business priorities

**Slide 18: Next Steps**

* Detailed technical proof of concept
* Performance testing of both architectures
* Cost analysis and resource planning
* Roadmap development for implementation
* Stakeholder review and decision

**Slide 19: Questions & Discussion**

Thank you!