Architecture Decision Record (ADR) - Multitenancy & Subscription based SaaS model

Decision Summary

Adopt Multitenancy & Subscription-based SaaS Model for the Fish Watch System to support a diverse range of customers, from individual aquarium owners to large-scale farm operators with multiple farms.

Context

The Fish Watch System aims to provide monitoring and management capabilities for fish farms, catering to a diverse customer base with varying needs and scales of operation. Adopting a Multitenancy & Subscription-based SaaS Model allows the system to efficiently serve customers of different sizes and requirements while maximizing flexibility and scalability.

Decision Drivers

1. **Scalability**: The architecture must scale seamlessly to accommodate varying numbers of users and farms, from small-scale aquarium owners to large farm operators.
2. **Flexibility**: The system should be flexible enough to adapt to the needs of different customers, offering customizable features and pricing plans.
3. **Cost-Effectiveness**: Leveraging a subscription-based model enables customers to pay for the services they need, allowing for cost optimization and resource allocation.
4. **Market Reach**: Multitenancy enables the system to serve multiple customers simultaneously, expanding its market reach and revenue potential.
5. **Simplicity**: A centralized system architecture simplifies management, updates, and maintenance, reducing operational overhead.

Considered Options

1. **Multitenancy & Subscription-Based Model**: Implement a shared architecture where multiple customers (tenants) access the same instance of the application through subscriptions, with data isolation and customization options.
2. **Single-Tenant & Perpetual License Model**: Provide dedicated instances of the application for each customer with perpetual licenses, offering tailored solutions but requiring more resources and management overhead.

Decision Outcome

We choose to adopt a Multitenancy & Subscription-based SaaS Model for the Fish Watch System.

Pros and Cons of the Selected Option

Pros

- **Scalability**: Multitenancy allows the system to scale efficiently to serve a large number of users and farms without the need for individual instances.
- **Flexibility**: Subscription-based pricing offers customers customizable plans and features, catering to their specific needs and budgets.
- **Cost-Effectiveness**: Customers pay for the services they use, reducing upfront costs and allowing for cost optimization.
- **Market Reach**: Serving multiple customers simultaneously expands the system's market reach and revenue potential.
- **Simplicity**: A shared architecture simplifies management, updates, and maintenance, reducing operational overhead.

Cons

- **Data Isolation**: Ensuring data privacy and security for each tenant requires robust isolation mechanisms and access controls.
- **Customization Complexity**: Providing customizable features may introduce complexity in implementation and management, requiring careful design and testing.

Risks and Mitigations

- **Data Security**: Implement robust data isolation and access controls to mitigate the risk of unauthorized access to tenant data.
- **Performance Optimization**: Optimize system performance to ensure responsiveness and scalability under varying load conditions, minimizing the risk of performance degradation.
- **Customer Satisfaction**: Regularly gather feedback from customers to identify areas for improvement and address any concerns or issues promptly.

Consequences

Adopting a Multitenancy & Subscription-based SaaS Model enables the Fish Watch System to efficiently serve a diverse customer base while maximizing scalability, flexibility, and cost-effectiveness. However, it requires careful consideration of data isolation, customization

complexity, and performance optimization to ensure a seamless and satisfactory experience for customers across different usage scenarios and scales of operation.