**PRD**

**This PRD has been formatted so that it doesn’t contain any sensitive, IP information/data**

**Objective:**  
Migrate IOT App from legacy on prem middleware platform to one of the following public cloud provider, AWS, Azure, GCP. The migration aims to improve scalability, reduce costs, and enhance operational efficiency.

**Scope:**  
This PRD covers the requirements for migrating IOT application servers, databases, storage, etc.

Elastic Load Balancers to auto-scale during peak and off peak hours

RDS Database to store customer data

Integrate cloudwatch to measure latency and collect metrics on user logins, time to resolve issues by support engineers etc.

Use AI/ML Models to predict if support time can be improved by using supervised and labelled data of customers with whom the support engineers are interacting

Train data sets to provide information on the dependent variables

Work with data scientists to choose the right AI model

**Out of scope for this project are:**

Support on mobile devices and other platforms.

**Success Metrics:**

* Reduce operational costs by 90%.
* Achieve availability target 99.9% uptime post-migration.
* Decrease deployment times by 50% or more
* Improve application performance by: e.g., response time by 20%.

**2. Key Goals and Requirements**

**2.1 Business Goals**

* Enable flexible scaling to support fluctuating workloads.
* Simplify infrastructure management and reduce time for upgrades.

**2.2 Functional Requirements**

* **Compute Resources:** Provision virtual machines or serverless functions as required to support current application workloads.
* **Data Storage:** Migrate existing databases to cloud-native storage solutions-Amazon RDS and ensure data consistency.
* **Networking:** Implement secure network configurations to control access (e.g., VPC setup, firewalls).
* **Disaster Recovery & Backup:** Establish automated backups and disaster recovery plans, with recovery time objective, RTO of 4 hours

**2.3 Non-Functional Requirements**

* **Scalability:** Support auto-scaling to handle increased load without manual intervention.
* **Security:** Ensure encryption at rest and in transit, and set up identity and access management (IAM) policies.
* **Performance:** Application should have no more than a specific latency target, 100ms increase in response times as mentioned in the AWS documentation

**3. Assumptions and Dependencies**

* **Assumptions:**
  + The application codebase is compatible with the target cloud environment.
  + The current infrastructure is fully documented for a smooth migration process.
* **Dependencies:**
  + Required cloud infrastructure (e.g., VPCs, IAM) will be provisioned by the cloud provider’s setup team.
  + Collaboration with [IT team, DevOps, security team] is necessary to meet compliance and security requirements.

**4. User Stories**

1. **As a systems administrator,** I want to monitor cloud resources in real time so that I can respond promptly to any performance issues.
2. **As a security engineer,** I want all sensitive data to be encrypted to meet industry standards and regulatory requirements.
3. **As a developer,** I want to deploy updates to the application without service interruption, so users experience continuous availability.

**5. Technical Requirements**

**5.1 Cloud Service Setup**

* **Compute:** Define instance types and sizing based on current workloads.
* **Storage:** Select appropriate storage classes and configure backup policies.
* **Networking:** Configure VPN or direct connection for secure, low-latency access.

**5.2 Migration Process**

* **Data Transfer:** Use data migration tool, AWS Database Migration Service to move data.
* **Testing:** Conduct pre- and post-migration testing to verify functionality and performance.
* **Cutover Plan:** Outline steps for final cutover to ensure minimal downtime.

**5.3 Post-Migration Monitoring and Maintenance**

* **Monitoring Tools:** Configure monitoring tool, e.g., CloudWatch for continuous monitoring.
* **Incident Management:** Establish a procedure for incident response in case of outages or service degradation.
* **Optimization:** Regularly review and optimize resources for cost efficiency and performance.

**6. Risks and Mitigations**

| **Risk** | **Impact Level** | **Mitigation Strategy** |
| --- | --- | --- |
| Data loss during migration | High | Implement regular backups before and during migration. |
| Application compatibility issues | Medium | Conduct thorough testing and set up a staging environment. |
| Security vulnerabilities | High | Conduct a security audit and enforce strict IAM policies. |

**7. Timeline and Milestones**

1. **Preparation Phase:**2-3 weeks- Set up the cloud environment, configure networks, and establish IAM roles.
2. **Data Migration:** 2-3 weeks - Migrate databases, conduct data validation.
3. **Application Migration:** 3 weeks- Deploy application components and test integrations.
4. **Testing Phase:** 1 week- Perform load testing, security testing, and UAT.
5. **Go-Live:** 3 days- Final cutover to cloud, verify performance.
6. **Post-Migration Review:** **ongoing-** Optimize configurations, finalize documentation.

**8. Acceptance Criteria**

* All migrated services meet predefined performance benchmarks.
* Security configurations comply with legal and security teams
* Downtime during migration does not exceed 30 minutes.
* Successfully documented all procedures and provided training for ongoing maintenance.

**Product Vision**

**Vision**

* **Statement**:  
  Enable a secure, scalable, and cost-effective cloud environment that enhances business agility, supports rapid innovation, and improves operational efficiency across the organization.
* **Objectives**:
  + Improve scalability and flexibility to support business growth.
  + Reduce infrastructure costs and improve cost predictability.
  + Enhance security, data protection, and compliance with industry regulations.
  + Provide a high-performing, reliable infrastructure that ensures minimal downtime.
  + Enable a faster time-to-market for new features and product updates.
  + Foster a data-driven culture with real-time analytics capabilities.

**2. Target Group (Key Stakeholders)**

* **Primary Stakeholders**:
  + **IT/Infrastructure Teams**: Responsible for managing, deploying, and optimizing cloud resources.
  + **Analytics and Data Teams**: Rely on cloud capabilities for data storage, processing, and analytics to support business insights.
  + **Development/Engineering Teams**: Require a cloud environment that supports DevOps practices and agile development.
  + **Risk and Compliance Teams**: Ensure that data protection, security, and regulatory compliance standards are maintained.
  + **Customer Success and Support Teams**: Benefit from improved application performance and uptime for customer-facing tools.
* **Secondary Stakeholders**:
  + **Business Leadership**: Seeks to leverage cloud migration to reduce costs and improve operational efficiency.
  + **Finance and Procurement**: Focused on cost savings, resource management, and budgeting for cloud services.
  + **End Users**: Both internal teams and external customers, who will experience improved application performance and data accessibility.

**3. Needs (Problems to Solve)**

* **Scalability Limitations**:
  + Current on-premises infrastructure lacks the scalability to handle rapid changes in demand, causing delays in scaling up services or applications.
* **High Operational Costs**:
  + Maintaining physical infrastructure is costly, with high capital expenditures and ongoing maintenance expenses.
* **Security and Compliance**:
  + Need for stronger security controls, data encryption, and compliance with data residency laws which are challenging to maintain on-premises.
* **Limited Agility**:
  + Long provisioning times for new servers and resources hinder agile development and impact time-to-market for new features and services.
* **Inconsistent Performance**:
  + Applications and data processing may experience performance bottlenecks during peak times, affecting both user and customer experience.
* **Data Accessibility**:
  + Lack of real-time data access for analytics and business intelligence due to limited data integration capabilities with current infrastructure.

**4. Product (Solution/Features)**

* **Scalable Cloud Infrastructure**:
  + Leverage cloud elasticity to scale resources up or down based on demand, supporting high traffic without compromising performance.
* **Cost Management and Optimization Tools**:
  + Use cost management tools and reserved instance options to track and control cloud spend, with real-time visibility and budget alerts.
* **Enhanced Security and Compliance**:
  + Implement cloud-native security features, such as Identity and Access Management (IAM), data encryption, and compliance auditing, to meet regulatory standards.
* **Automated Deployment and DevOps Integration**:
  + Enable CI/CD pipelines, Infrastructure as Code (IaC), and other DevOps practices to accelerate deployment and improve operational efficiency.
* **Real-Time Analytics and Data Integration**:
  + Establish a cloud-based data warehouse and integrate real-time analytics tools to provide on-demand business insights.
* **Backup, Recovery, and Disaster Recovery**:
  + Implement automated backup, failover, and disaster recovery plans for high availability and business continuity.
* **Monitoring and Alerting Systems**:
  + Use monitoring and alerting tools for performance tracking, proactive issue resolution, and security threat detection.

**5. Business Goals (Key Results)**

* **Goal 1: Improve Operational Efficiency**
  + **Key Results**:
    - Reduce infrastructure management time by 30%.
    - Decrease server provisioning times from weeks to minutes.
* **Goal 2: Achieve Cost Savings**
  + **Key Results**:
    - Reduce total infrastructure costs by 20%.
    - Optimize cloud resource allocation to minimize idle resource costs by 15%.
* **Goal 3: Enhance Security and Compliance**
  + **Key Results**:
    - Achieve 100% compliance with required regulatory standards (e.g., GDPR, HIPAA).
    - Implement multi-factor authentication and encryption for all sensitive data within 90 days post-migration.
* **Goal 4: Increase Scalability and Resilience**
  + **Key Results**:
    - Scale up or down resources based on demand with no downtime for end users.
    - Achieve a 99.99% uptime across critical applications.
* **Goal 5: Drive Business Agility and Innovation**
  + **Key Results**:
    - Enable 25% faster time-to-market for new features and updates.
    - Reduce deployment time by 40% with DevOps and CI/CD pipeline implementation.

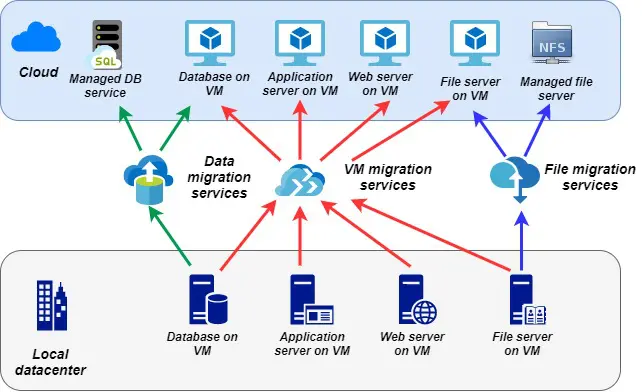
**6. Metrics (KPIs)**

* **Cost Efficiency**:
  + Actual vs. budgeted costs, cost savings over time, resource utilization efficiency.
* **System Uptime and Performance**:
  + Uptime percentage, mean time to recovery (MTTR), average application response time.
* **Security and Compliance**:
  + Incident response time, compliance audit pass rate, user access and permission accuracy.
* **User Satisfaction and Adoption**:
  + User feedback scores, customer satisfaction (CSAT), support ticket volume related to migration impact.
* **Operational Efficiency**:
  + Deployment frequency, resource provisioning time, infrastructure management time.

**7. Potential Risks and Mitigation Strategies**

* **Risk: Data Loss or Corruption**
  + **Mitigation**: Perform regular backups before, during, and after migration; validate data integrity post-migration.
* **Risk: Downtime During Migration**
  + **Mitigation**: Conduct phased migration and plan during low-traffic times; implement a rollback strategy.
* **Risk: Cost Overruns**
  + **Mitigation**: Implement real-time cost monitoring and budget alerts; use reserved instances where applicable.
* **Risk: Compliance and Security Breaches**
  + **Mitigation**: Ensure all configurations meet compliance standards; conduct security audits and maintain IAM policies.
* **Risk: User Resistance to Change**
  + **Mitigation**: Provide training, clear communication, and support resources to ease the transition for users.

Mockups and Flow Diagrams



High Level use case diagrams

