

Service Name

Amazon DocumentDB (with MongoDB compatibility)

Service Overview

Amazon DocumentDB is a fully managed, MongoDB-compatible document database service provided by AWS. It enables organizations to store, query, and index JSON-like documents with complex queries, indexing, and aggregation capabilities while using existing MongoDB drivers and tools with minimal changes. The service separates storage and compute, allowing independent scaling, and provides enterprise-grade reliability with automatic backup, high availability across multiple Availability Zones, and built-in security features including VPC isolation and encryption.

Key Use Cases

- **Content Management Systems:** Managing user-generated content like images, comments, and videos with flexible schema requirements for various content types
- **E-commerce Applications:** Handling product catalogs, customer profiles, shopping carts, and order management with complex nested data structures
- **Mobile and Web Applications:** Storing user profiles, session data, and application metadata with variable attributes and rapid development cycles
- **IoT Applications:** Collecting and analyzing sensor data, device telemetry, and time-series information from connected devices
- **Real-time Analytics:** Processing operational data for business intelligence while maintaining concurrent access for analysis and reporting

Features

- **MongoDB Compatibility:** Compatible with MongoDB 3.6, 4.0, 5.0, and 8.0 APIs, supporting existing drivers, tools, and applications
- **Serverless Configuration:** Automatic capacity scaling with DocumentDB Capacity Units (DCUs) providing up to 90% cost savings for variable workloads
- **Elastic Clusters:** Virtually limitless scale supporting millions of reads/writes with petabytes of storage capacity across multiple shards
- **Vector Search:** HNSW and IVFFlat indexing methods for semantic search with parallel index building reducing build time by up to 30x
- **ACID Transactions:** Multi-document ACID transactions ensuring data consistency across operations
- **Point-in-Time Recovery:** Restore clusters to any second within 1-35 day backup retention period with continuous incremental backups
- **Global Clusters:** Multi-region clusters with primary and up to 5 secondary regions for disaster recovery and low-latency global reads

- **Advanced Query Capabilities:** Aggregation pipelines, geospatial querying, text search, and complex array operations

Value Proposition

Amazon DocumentDB provides superior value through its fully managed nature, eliminating database administration overhead while delivering twice the throughput of traditional managed MongoDB services. The service offers enterprise-grade reliability with six-way data replication across three Availability Zones, handling up to two data copy losses without affecting writes and three losses without affecting reads:

- Its MongoDB compatibility enables seamless migration with existing applications, drivers, and tools, while providing enhanced security through VPC isolation, encryption at rest and in transit, and IAM integration
- The serverless option delivers significant cost optimization for variable workloads, and the elastic clusters provide virtually unlimited scalability for demanding applications

Service Integration

Amazon DocumentDB integrates deeply with the AWS ecosystem through multiple core services. AWS Database Migration Service (DMS) enables seamless migration from MongoDB and other databases with minimal downtime:

- Amazon CloudWatch provides comprehensive monitoring, metrics, and alarms for performance tracking
- AWS Glue supports data cataloging and ETL operations for analytics workflows
- Amazon S3 stores automated backups and snapshots durably
- Amazon VPC ensures network isolation and security
- AWS Identity and Access Management (IAM) provides granular access control and authentication
- Integration with Amazon Redshift and Amazon OpenSearch Service enables analytics and search capabilities, while AWS Backup supports centralized backup management across AWS services

Onboarding and Offboarding

Customers begin by creating an AWS account and setting up IAM permissions, then create a DocumentDB cluster through the AWS Management Console, AWS CLI, or CloudFormation templates. The process requires configuring VPC settings with subnets across multiple Availability Zones, selecting instance types, and defining security groups:

- AWS CloudShell provides immediate connectivity for testing and initial data operations

- The getting started guide enables cluster creation and data operations in under five minutes
- Customers can migrate existing MongoDB data using AWS DMS, native MongoDB tools (mongodump/mongorestore), or third-party migration utilities
- Free tier eligibility allows new customers to explore the service with 750 hours of t3.medium instance usage monthly

Getting Started Guide:

<https://docs.aws.amazon.com/documentdb/latest/developerguide/get-started-guide.html>

Data Removal

Customers can remove data by deleting individual documents, collections, or entire databases using MongoDB commands. Cluster-level removal involves deleting the cluster through AWS console or CLI, which removes all instances and data. Manual snapshots can be retained or deleted separately. Automated backups are deleted when the cluster is removed, but manual snapshots persist until explicitly deleted. For complete data removal, customers must delete both the cluster and all associated manual snapshots. The deletion process is irreversible, requiring careful consideration and backup verification.

Backup/Restore and Disaster Recovery

Amazon DocumentDB provides automated continuous incremental backups to Amazon S3 with 1-35 day retention periods, enabling point-in-time recovery to any second. Manual snapshots offer long-term retention beyond the automatic backup period. Global clusters support disaster recovery with primary and secondary regions, providing cross-region data replication. The service offers near-instant crash recovery typically under 30 seconds using log-structured storage. Backup operations have zero impact on cluster performance.

Backup Capabilities

DocumentDB includes comprehensive backup capabilities with automatic continuous incremental backups stored in Amazon S3. The service supports manual cluster snapshots that can be copied across regions and shared with other AWS accounts:

- Backup storage up to 100% of cluster storage incurs no additional charges
- AWS Backup service integration enables centralized backup management and policy-based protection
- Backups are encrypted using the same KMS keys as the source cluster

Disaster Recovery

DocumentDB supports disaster recovery through Global Clusters spanning multiple AWS regions with automatic failover capabilities. The service replicates data six ways across three Availability Zones within each region, providing built-in fault tolerance:

- Cross-region snapshots enable recovery in different geographical locations
- The log-structured storage system ensures rapid recovery with minimal data loss
- AWS Elastic Disaster Recovery integration is not explicitly supported, but Global Clusters provide comprehensive disaster recovery functionality

Recovery Objectives

DocumentDB helps meet RPO objectives through continuous incremental backups with point-in-time recovery granularity to the second, minimizing potential data loss. RTO objectives are addressed through near-instant crash recovery under 30 seconds, automatic failover to read replicas within minutes, and Global Cluster failover capabilities. The six-way data replication across Availability Zones ensures high availability and rapid recovery. Customers can achieve aggressive RPO/RTO targets through proper architecture using read replicas and Global Clusters.

Service Constraints

Service Quotas:

<https://docs.aws.amazon.com/documentdb/latest/developerguide/limits.html>

FAQ: <https://aws.amazon.com/documentdb/faqs/>

Technical Requirements

Service Documentation:

<https://docs.aws.amazon.com/documentdb/latest/developerguide/what-is.html>

User Guide: <https://docs.aws.amazon.com/documentdb/latest/developerguide/>

API Reference: <https://docs.aws.amazon.com/documentdb/latest/developerguide/api-reference.html>

Pricing Overview

Please see the AWS UK G Cloud 15 Pricing Document accompanying this service in the Digital Marketplace.

Public Pricing: <https://aws.amazon.com/documentdb/pricing/>

Cost Optimization

DocumentDB offers unique cost optimization through serverless configurations providing up to 90% savings for variable workloads compared to provisioning for peak capacity. Database Savings Plans deliver up to 35% savings with 1-year commitments:

- I/O-Optimized storage configurations provide predictable pricing for I/O-intensive applications

- Customers can optimize costs through right-sizing instances, utilizing read replicas to distribute workloads, implementing efficient indexing strategies, and leveraging storage auto-scaling
- The service offers single-instance durability options and the ability to pause/resume clusters for development environments
- Per-second billing with 10-minute minimums enables precise cost control

Savings Considerations

Primary cost savings come from the fully managed service eliminating operational overhead and administrative costs associated with self-managed MongoDB deployments. Serverless configurations automatically scale capacity based on demand, avoiding overprovisioning costs:

- Database Savings Plans provide significant discounts for predictable workloads
- The separation of compute and storage allows independent scaling, optimizing resource utilization
- Automated backup and storage management reduce operational costs
- Multi-AZ replication is included without additional charges
- Free backup storage up to 100% of cluster storage reduces backup costs
- Customers achieve additional savings through proper instance sizing, efficient query design, and leveraging read replicas for read-heavy workloads