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Features and Technical Specifications

金蝶Apusic分布式缓存 V2.0.4

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目录

1 Preface

This document provides the functional specifications for Apusic In-Memory Data Cache (AMDC) V2.0.4, helping users understand the product features and technical indicators in detail.

1.1 Target Audience

This document is intended for IT information business managers, R&D managers, software project managers, software architects, and operations engineers.

1.2 Related Documentation

For more information about AMDC V2.0.4, please refer to the following AMDC V2.0.4 product manual documentation set:

No.	Document	Description
1	Apusic In-Memory Data Cache V2.0.4 Quick Start Guide	A brief introduction on how to quickly get started with AMDC.
2	Apusic In-Memory Data Cache V2.0.4 Installation Guide	Detailed introduction on how to install AMDC on various operating systems, AMDC service start/stop operations, and product registration process.
3	Apusic In-Memory Data Cache V2.0.4 Core User Manual	Detailed introduction on how to use, configure, and manage AMDC features and supporting tools.
4	Apusic In-Memory Data Cache V2.0.4 Console User Manual	Detailed instructions on using and operating AMDC console features.
5	Apusic In-Memory Data Cache V2.0.4 Development Guide	Detailed instructions for developing AMDC client applications using various programming languages.
6	Apusic In-Memory Data Cache V2.0.4 Migration Guide	Detailed instructions for migrating AMDC from historical versions to V2.0.4, as well as migrating from Redis to AMDC.
7	Apusic In-Memory Data Cache V2.0.4 Operations Guide	Detailed instructions for AMDC monitoring, operations, security hardening, and other operational procedures.
8	Apusic In-Memory Data Cache V2.0.4 Performance Tuning Guide	Detailed instructions for AMDC performance tuning.

1.3 Technical Support

AMDC products provide comprehensive technical support services. You can obtain technical support through the following channels:

- Website: www.apusic.com
- Phone: 400-855-5800
- Email: support@apusic.com
- Kingdee Cloud Community: https://vip.kingdee.com/?productId=73&productLineId=14&lang=zh-CN

When requesting technical support, please provide the following information:

1. Your name
2. Company information and contact details
3. Operating system and version
4. Product version number
5. Detailed information including logs, screenshots, etc. of any exceptions or errors

2 Product Overview

Apusic In-Memory Data Cache Software (Apusic In-Memory Data Cache, abbreviated as AMDC) is an enterprise-level high-performance distributed cache middleware that is 100% compatible with Redis protocol and development ecosystem, enabling seamless migration without modifying existing business applications. AMDC features core capabilities including high-performance millisecond-level response, high availability with multi-replica fault tolerance, high scalability with elastic expansion, and refined web-based visual management, providing secure and reliable high-frequency data access support for critical business in high-concurrency and distributed scenarios, reducing database pressure and improving overall system throughput.

3 Features and Technical Specifications

3.1 Core Cache Capabilities

Feature Category	Feature Item	Description
Data Type Support	String / Hash / List / Set / ZSet / Stream / Bitmap / HyperLogLog	Complete support for Redis 6+ core data structures, meeting diverse business scenarios
High-Performance Read/Write	Multi-threaded network IO + Single-threaded command execution	Single-node throughput up to 140,000 QPS
Memory Management	Multiple eviction policies (LRU/LFU/Random/TTL, etc.)	Supports fine-grained memory control, avoiding OOM
Lua Scripting	EVAL / EVALSHA / SCRIPT LOAD / SCRIPT KILL	Supports atomic execution of complex logic, compatible with Redis Lua syntax

3.2 High Availability and Disaster Recovery

Mode	Node Role	Failover	Data Synchronization	Applicable Scenarios
Standalone Mode	Single node	None	None	Development testing, low-risk business
Master-Slave Replication	1 master + N slaves	Manual switching	Asynchronous/semi-synchronous replication	Read-write separation, data backup
Sentinel Mode	1 master + N slaves + sentinels ≥3	Automatic failover	Asynchronous replication	High availability production environment
Cluster Mode	Masters ≥3 + Slaves ≥3	Automatic failover + Data sharding	Gossip protocol communication	High concurrency, large capacity, elastic scaling

> *Note: Cluster mode supports 16,384 hash slots, automatically allocated and rebalanced.*

3.3 Security Capabilities

Security Dimension	Feature	Description

Authentication Mechanism	`requirepass` / ACL user system	Supports password authentication and fine-grained permission control
Transport Encryption	TLS 1.2/1.3 mutual authentication	Supports TLS encrypted transmission
Audit Logging	`MONITOR` command	Real-time recording of all operation commands (including timestamp, client IP, DB number)

3.4 Operations and Management

Feature	Tool/Command	Description
Cluster Management	`amdc-cli --cluster`	Create/check/repair/scale cluster
Performance Testing	`amdc-benchmark`	Built-in stress testing tool, supports custom parameters
Data Migration	RDB/AOF file compatibility	Supports Redis ↔ AMDC bidirectional data migration
Configuration Hot Reload	`CONFIG REWRITE`	Dynamically update partial configurations (except `bind`, etc.)
License Management	Feature code binding / Hot update	Supports KBC authorization, unified authorization center, local authorization

3.5 Persistence and Reliability

Mechanism	Method	Features
RDB Snapshot	`SAVE` / `BGSAVE` / Scheduled trigger	Supports LZF compression, CRC64 checksum
AOF Log	Append Only File	Supports `fsync everysec`, incremental synchronization
Hybrid Persistence	RDB + AOF	Balances recovery speed and data integrity
File Repair	`aof-check-aof --fix`	Automatically repair corrupted AOF tail

4 Technical Indicators

4.1 Performance Indicators

> *Note: The following performance indicators are based on typical server configuration: 8-core 16GB specifications*

Scenario	Indicator	Value
SET/GET	Throughput	≥ 120,000 QPS
Pipeline	Throughput	≥ 200,000 QPS
Latency	P99	< 2ms
Memory Efficiency	Storage Overhead	≤ 1.2x original data size

4.2 Scale Capabilities

Item	Capacity Limit
Maximum Connections	10,000 (limited by system ulimit)
Single Instance Maximum Memory	No hard limit (limited by system hardware memory) (recommended ≤ 32GB)
Cluster Node Count	≥ 1000 (theoretical)
Single Key Maximum Value	512MB

4.3 Protocol Compatibility

- Fully compatible with Redis 6.0 RESP2/RESP3 protocol
- Supports mainstream clients:
  - Java: Jedis, Lettuce
  - Python: redis-py
  - Go: go-redis
  - C/C++: hiredis
  - Node.js: ioredis

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5 Deployment and Runtime Environment

5.1 Hardware Requirements

Deployment Mode	Operating System	Installation Content	Hardware Specifications (CPU/Memory/Disk)	Server Count
Standalone	Linux	AMDC Console, AMDC Service	8-core/16GB/100GB	1
Master-Slave	Linux	AMDC Console, AMDC Service	8-core/16GB/100GB	2
Sentinel	Linux	AMDC Console, AMDC Service	8-core/16GB/100GB	3
Cluster	Linux	AMDC Console, AMDC Service	8-core/16GB/100GB	3

5.2 Software Environment

Category	Supported Items
CPU Architecture	x86_64, ARM64 (Kunpeng/Phytium)
Operating System	Galaxy Kylin, UOS, NeoKylin, CentOS 7+, Ubuntu 18.04+
Container Platform	Docker, Kubernetes
Installation Method	tar.gz / RPM / Docker image

5.3 Default Ports

Component	Port	Purpose
Cache Core	6359	Client data access
Sentinel Service	26359	Sentinel communication and monitoring
Cluster Bus	16359 (6359+10000)	Inter-node Gossip communication

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