



Features and Technical Specifications

Apusic In-Memory Data Cache

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1 Preface

This document provides the functional specifications for Apusic In-Memory Data Cache (AMDC) V2.0.6, helping users understand the product features and technical indicators of AMDC V2.0.6 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 V2.0.6, please refer to the following AMDC V2.0.6 product manual documentation set:

No.	Document	Description
1	Apusic In-Memory Data Cache V2.0.6 Quick Start Guide	A brief introduction on how to quickly get started with AMDC.
2	Apusic In-Memory Data Cache V2.0.6 Installation Guide	Detailed introduction on how to install AMDC on various operating systems, AMDC service start/stop operations, and the product registration process.
3	Apusic In-Memory Data Cache V2.0.6 Cache Core User Manual	Detailed introduction on how to use, configure, and manage AMDC features and supporting tools.
4	Apusic In-Memory Data Cache V2.0.6 Console User Manual	Detailed instructions on using and operating AMDC console features.
5	Apusic In-Memory Data Cache V2.0.6 Development Guide	Detailed instructions for developing AMDC client applications using various programming languages.
6	Apusic In-Memory Data Cache V2.0.6 Migration Guide	Detailed instructions for migrating AMDC from historical versions to V2.0.6, as well as migrating from Redis to AMDC.
7	Apusic In-Memory Data Cache V2.0.6 Operations Guide	Detailed instructions for AMDC monitoring, operations, security hardening, and other operational procedures.
8	Apusic In-Memory Data Cache V2.0.6 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-grade, high-performance distributed cache middleware that is fully compatible with the 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 (Queries Per Second, theoretical peak value)
Memory Management	Multiple eviction policies (LRU (Least Recently Used) / LFU (Least Frequently Used) / Random / TTL, etc.)	Supports fine-grained memory control, avoiding Out Of Memory (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 and testing, low-risk business
Master-Slave Replication	1 master + N slaves	Manual switchover	Asynchronous/semi-synchronous replication	Read-write separation, data backup
Sentinel Mode	1 master + N slaves + Sentinels ≥ 3	Automatic failover	Asynchronous replication	High-availability production environments
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, with automatic allocation and rebalancing.

3.3 Security Capabilities

Security Dimension	Feature	Description
Authentication Mechanism	<code>requirepass</code> / Access Control List (ACL) user system	Supports password authentication and fine-grained permission control
Transport Encryption	TLS 1.2/1.3 mutual authentication	Supports GM TLS encrypted transmission (Chinese national cryptographic algorithms)
Audit Logging	<code>MONITOR</code> command	Real-time recording of all operation commands (including timestamp, client IP, and DB number)

3.4 Operations and Management

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

3.5 Persistence and Reliability

Mechanism	Method	Features
RDB Snapshot	<code>SAVE</code> / <code>BGSAVE</code> / Scheduled trigger	Supports LZF (compression algorithm) compression and Cyclic Redundancy Check (CRC64)
AOF Log	Append Only File	Supports <code>fsync everysec</code> and incremental synchronization
Hybrid Persistence	RDB + AOF	Balances recovery speed and data integrity
File Repair	<code>aof-check-aof --fix</code>	Automatically repairs the corrupted AOF tail

4 Technical Indicators

4.1 Performance Indicators

Note: The following performance indicators are based on a typical server configuration: 8-core 16GB specification

Scenario	Indicator	Value
SET/GET	Throughput	$\geq 120,000$ QPS (guaranteed value in typical scenarios)
Pipeline	Throughput	$\geq 200,000$ QPS
Latency	P99 latency (response time for 99% of requests)	$< 2\text{ms}$
Memory Efficiency	Storage overhead	$\leq 1.2\text{x}$ 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 at the software level (limited by the physical memory of the operating system); in production environments, it is recommended that a single instance does not exceed 32GB
Cluster Node Count	≥ 1000 (theoretical)
Single Key Maximum Value	512MB

4.3 Protocol Compatibility

- Fully compatible with the Redis 6.0 Redis Serialization Protocol (RESP2/RESP3)
- Supports mainstream clients:
 - Java: Jedis, Lettuce
 - Python: redis-py

- Go: go-redis
 - C/C++: hiredis
 - Node.js: ioredis
-

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

UNIFIED SERVICE HOTLINE

4008-555-800

Kingdee Apusic Cloud Computing Co., Ltd. (referred to as “Kingdee Apusic”) was founded in 2000. Its predecessor was “Kingdee Middleware Company.” It is a basic software platform provider under Kingdee Group, a national standards-setting enterprise for cloud computing, and a core software enterprise in the national IT application innovation industry. Kingdee Apusic is an enterprise undertaking the National 863 Key R&D Program and the National Major Science and Technology Project for Core Electronic Components, High-end General-purpose Chips and Fundamental Software, and is also a basic platform provider for the national key projects of “Two Networks, One Website, Four Databases, and Twelve Golden Projects.” Its products are widely used in key industries such as government, military, finance, and energy, and it has cumulatively served more than 100,000 customers.



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