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Cloud Database Dedicated Cluster

Product Introduction

Document Version: 20220712

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Document conventions

Style	Description	Example
Danger	A danger notice indicates a situation that will cause major system changes, faults, physical injuries, and other adverse results.	**Danger:** Resetting will result in the loss of user configuration data.
Warning	A warning notice indicates a situation that may cause major system changes, faults, physical injuries, and other adverse results.	**Warning:** Restarting will cause business interruption. About 10 minutes are required to restart an instance.
Notice	A caution notice indicates warning information, supplementary instructions, and other content that the user must understand.	**Notice:** If the weight is set to 0, the server no longer receives new requests.
Note	A note indicates supplemental instructions, best practices, tips, and other content.	**Note:** You can use Ctrl + A to select all files.
>	Closing angle brackets are used to indicate a multi-level menu cascade.	Click **Settings**> **Network**> **Set network type**.
Bold	Bold formatting is used for buttons , menus, page names, and other UI elements.	Click **OK**.
`Courier font`	Courier font is used for commands	Run the `cd /d C:/window` command to enter the Windows system folder.
Italic	Italic formatting is used for parameters and variables.	`bae log list --instanceid` *Instance_ID*
[] or [a|b]	This format is used for an optional value, where only one item can be selected.	`ipconfig [-all|-t]`
{} or {a|b}	This format is used for a required value, where only one item can be selected.	`switch {active|stand}`

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1.What is ApsaraDB MyBase?

This topic describes ().

Product introduction

or for short is a database solution. ApsaraDB MyBase is developed by Alibaba Cloud to provide customized and optimized database services for enterprise users. An ApsaraDB MyBase dedicated cluster consists of multiple underlying hosts. These hosts can be Elastic Compute Service (ECS) instances of the i2 instance family or ECS Bare Metal instances. An ApsaraDB MyBase dedicated cluster provides more database services than fully managed database solutions.

supports MySQL, SQL Server, and PostgreSQL. ApsaraDB MyBase allows you to use dedicated cloud resources and supports resource overcommit. ApsaraDB MyBase also supports customized O&M and allows you to grant OS permissions and users permissions on specified databases in a dedicated cluster. Therefore, ApsaraDB MyBase provides flexible and easy-to-use database services and also meets the requirements of your enterprise for database regulatory compliance and database security.

Features

allows you to manage multiple instances in a dedicated cluster. You can create multiple dedicated clusters in a region. Each dedicated cluster can contain multiple hosts and each host can deploy multiple instances.

provides the following features for dedicated clusters:

- Resource scheduling: You can configure an overcommit ratio for each type of resource to maximize the resource usage. Resources are divided into multiple types, such as CPU, memory, storage capacity, IOPS, and network traffic.
- Host management: A host serves as a carrier for resources. You can manage hosts. For example, you can add, replace, and connect to hosts. You can also specify whether instances can be allocated to a host.
- Instance management: You can manage the primary instance, secondary instances, read-only instances, and instances that are used to store log entries.

Supported database engines and instance editions

Database engine	Instance edition and database engine
MySQL	• High-availability Edition: MySQL 5.6, MySQL 5.7, and MySQL 8.0 • Master-replica Edition: MySQL 5.7 and MySQL 8.0

Database engine	Instance edition and database engine

SQL Server	• High-availability Edition:
	  ◦ SQL Server 2019 Standard Edition
	  ◦ SQL Server 2017 Standard Edition and SQL Server 2017 Enterprise Edition
	  ◦ SQL Server 2016 Standard Edition and SQL Server 2016 Enterprise Edition
	  ◦ SQL Server 2012 Standard Edition and SQL Server 2012 Enterprise Edition
	• Basic Edition:
	  ◦ SQL Server 2019 Standard Edition
	  ◦ SQL Server 2017 Standard Edition, SQL Server 2017 Enterprise Edition, and SQL Server 2017 Web Edition
	  ◦ SQL Server 2016 Standard Edition, SQL Server 2016 Enterprise Edition, and SQL Server 2016 Web Edition
	  ◦ SQL Server 2012 Standard Edition, SQL Server 2012 Enterprise Edition, and SQL Server 2012 Web Edition
	• Cluster Edition (Always On): SQL Server 2017 Enterprise Edition Always On and SQL Server 2019 Enterprise Edition Always On

PostgreSQL	High-availability Edition: PostgreSQL 10.0, PostgreSQL 11.0, PostgreSQL 12.0, and PostgreSQL 13.0

Billing

You are charged only for the hosts that you create and the enhanced SSDs that you use. You are not charged for using dedicated clusters, instances, memory, or local SSDs.

2.Key features

To keep pace with rapid business development and meet increasing business needs, ApsaraDB databases need to further develop their comprehensive capabilities to make operations and maintenance (O&M) more efficient. This topic describes the key features of .

Key features of ApsaraDB MyBase

- Enterprise-level database kernels

  uses an enhanced and optimized kernel based on an open source database kernel. For more information, see Kernel benefits.

- Fully managed database services

  provides a full range of database service capabilities, including installation, deployment, high availability, monitoring, alerting, account management, automatic optimization, and backup and restoration.

- Open operating system (OS) systems

  allows you to upload, download, and install software by using custom scripts in an independent and flexible manner. This meets the needs of large and medium-sized enterprises for custom database services. For more information, see Log on to a host by using a bastion host in Linux.

- User-level resource isolation

  You can purchase hosts so that your resources are completely isolated. Resource isolation avoids resource scrambling and ensures service stability.

- Reduced costs

  meets the business architecture requirements and allows you to take advantage of the different features of database resources. You can configure proper overcommitment ratios to maximize resource utilization and reduce costs. For more information, see Enable or disable instance allocation for a host.

3.Supported database engines and instance editions

This topic describes the database engines and instance editions that are supported by .

Supported database engines and instance editions

Database engine	Instance edition and database engine
MySQL	• High-availability Edition: MySQL 5.6, MySQL 5.7, and MySQL 8.0 • Master-replica Edition: MySQL 5.7 and MySQL 8.0

SQL Server	• High-availability Edition:
	  ◦ SQL Server 2019 Standard Edition
	  ◦ SQL Server 2017 Standard Edition and SQL Server 2017 Enterprise Edition
	  ◦ SQL Server 2016 Standard Edition and SQL Server 2016 Enterprise Edition
	  ◦ SQL Server 2012 Standard Edition and SQL Server 2012 Enterprise Edition
	• Basic Edition:
	  ◦ SQL Server 2019 Standard Edition
	  ◦ SQL Server 2017 Standard Edition, SQL Server 2017 Enterprise Edition, and SQL Server 2017 Web Edition
	  ◦ SQL Server 2016 Standard Edition, SQL Server 2016 Enterprise Edition, and SQL Server 2016 Web Edition
	  ◦ SQL Server 2012 Standard Edition, SQL Server 2012 Enterprise Edition, and SQL Server 2012 Web Edition
	• Cluster Edition (Always On): SQL Server 2017 Enterprise Edition Always On and SQL Server 2019 Enterprise Edition Always On

PostgreSQL	High-availability Edition: PostgreSQL 10.0, PostgreSQL 11.0, PostgreSQL 12.0, and PostgreSQL 13.0

4.Storage types

ApsaraDB MyBase provides the following types of data storage: local SSDs and enhanced SSDs (ESSDs). This topic describes a comparison between the storage types and provides suggestions for purchasing suitable disks.

Overview

Storage type	Description
ESSD	ESSDs are a new type of high-performance disks developed by Alibaba Cloud based on the next-generation distributed block storage architecture. Each ESSD uses the 25 Gigabit Ethernet technology and the remote direct memory access (RDMA) technology to provide up to one million random IOPS and reduce one-way latency. ESSDs are classified into the following types based on the performance level (PL): • PL1 ESSD: This is an ESSD of the PL1 type. • PL2 ESSD: A PL2 ESSD can provide approximately twice the IOPS and throughput that are provided by a PL1 ESSD. • PL3 ESSD: A PL3 ESSD can provide up to 20 times the IOPS that is provided by a PL1 ESSD. A PL3 ESSD can also provide 11 times the throughput that is provided by a PL1 ESSD. PL3 ESSDs are suitable for scenarios in which highly concurrent I/O requests need to be processed at low read and write latency.
Local SSD	Local SSDs are SSDs that are deployed on the same node as the database engine. You can use local SSDs to reduce I/O latency.

View the storage type of an ApsaraDB MyBase instance

Log on to the ApsaraDB MyBase console and go to the **Basic Information** page of your ApsaraDB MyBase instance. In the Basic Information section of the page, view Storage Type.

Comparison between storage types

Performance comparison

Storage type	I/O performance	Flexible specifications	Scalability
Local SSD	★★★★★ Provides low I/O latency and high I/O performance.	★★★★★ Provides various configuration options and allows you to increase the storage capacity of each disk. You cannot reduce the storage capacity.	★★★ May require a few hours to copy data when you scale up the database system.
ESSD (recommended)	★★★★★ Provides higher I/O performance than standard SSDs.		★★★★★ Supports online scale-up and scale-out that can be completed within a few minutes.

Storage types supported by database engines

Database engine	Host storage type
MySQL	• **Local SSD** • **ESSD**
SQL Server	• **ESSD** • **PL2 ESSD** • **PL3 ESSD**
PostgreSQL	**ESSD**

5.Benefits

5.1. Mechanisms and benefits

This topic describes the mechanisms and benefits of .

An dedicated cluster consists of multiple hosts. If your hosts use local SSDs, you are charged only for the hosts and your database instances that run on the hosts do not incur storage fees. You can deploy database instances on the hosts based on your business requirements. You can also specify an overcommit ratio for a specific type of resource to maximize resource utilization and improve cost-effectiveness. You can deploy multiple hosts in an dedicated cluster. A dedicated cluster is a dedicated cloud resource pool. In a resource pool, you can deploy databases that run the MySQL, SQL Server, and PostgreSQL engines. You can also manage your databases in a centralized manner. ApsaraDB MyBase can help you make full use of your host resources. If specific hosts in a dedicated cluster are idle and other hosts have excessive workloads, you can configure the system to migrate databases from the hosts that have excessive workloads to the idle hosts. This way, loads are balanced among all hosts. The following section provides a comparison between databases and self-managed databases:

Advantages of ApsaraDB MyBase databases compared with self-managed databases

databases provide the same features that are provided by self-managed databases. ApsaraDB MyBase databases also provide more benefits compared with self-managed databases. For more information, see Advantages of ApsaraDB MyBase over self-managed databases.

Advantages of ApsaraDB MyBase hosts

ApsaraDB MyBase provides the same features that are provided by self-managed databases and platform as a service (PaaS) databases such as RDS databases. ApsaraDB MyBase hosts also provides advanced features. provides the following benefits:

- More flexible resource scheduling
- More permissions
- More cost-effective
- Advanced database services for enterprises

More flexible resource scheduling

If you want to maximize the utilization of your host resources, you can allocate hosts in a dedicated cluster based on your business requirements. When you create a dedicated cluster, you can set the resource allocation policy to Balanced Allocation or Compact Allocation. The system automatically deploys new database instances in the cluster based on the policy that you specify. After the dedicated cluster runs for a specific period of time, you can reallocate hosts based on your business requirements. You can migrate a database instance from a host to another host in the dedicated cluster or migrate all database instances that are deployed on a host to other hosts.

More permissions

ApsaraDB MyBase supports more database permissions and OS permissions and also ensures the security of your databases. ApsaraDB MyBase allows you to run system commands, and read and write files to meet your O&M requirements. You can log on to a host from a bastionhost. This helps ensure the security of the host.

More cost-effective

ApsaraDB MyBase provides improved user experience and helps you reduce costs. Compared with self-managed databases, ApsaraDB MyBase can help you reduce monthly costs by approximately 50%.

Advanced database services for enterprises

ApsaraDB MyBase is integrated with the AliSQL and Tair kernels that are developed by Alibaba Cloud to provide database services for enterprises. This ensures the high stability, high performance, and high availability of ApsaraDB MyBase databases. ApsaraDB MyBase also provides features, such as the backup and restoration feature and the audit feature, to ensure that databases can run in a stable, secure, and efficient manner.

5.2. Advantages of ApsaraDB MyBase over self-managed databases

This topic describes the advantages of over self-managed databases.

Feature comparison between ApsaraDB MyBase and self-managed databases

Feature	ApsaraDB MyBase	Self-managed database
High availability	Performs automatic failover and recovery to ensure high availability.	You must purchase additional software or hardware to build a high-availability architecture.
Resource overcommitment	Provides overcommitment for CPU, memory, and disk resources to reduce costs.	Resource overcommitment is not supported.
Resource scheduling	Provides the even allocation policy to distribute workloads for promotional events and the compact allocation policy to fully utilize resources for daily business. The entire costs can be reduced by up to 60%.	You must separately configure or purchase Auto Scaling to schedule resources and meet your business requirements.
Database permission management	• Grants all operating system (OS) and database management permissions and allows you to customize the database management logic. • Allows you to log on to and manage hosts to ensure security by using bastion hosts. Bastion hosts provide features such as operation audit, access control, and security authentication.	You have all permissions on the databases.

Feature	ApsaraDB MyBase	Self-managed database
Hybrid deployment	• Allows you to deploy different applications and databases within a single dedicated cluster to meet business architecture requirements and improve database access efficiency. • Allows you to deploy multiple types of databases based on their load characteristics to make services more cost-effective.	• Different applications and databases can be deployed together. • You must separately configure or purchase Server Load Balancer (SLB) for balanced workload distribution.
High security	• Provides access link encryption, disk data encryption based on Bring Your Own Key (BYOK), data audit, and operation audit. • Allows you to deploy enterprise-specific audit tools for data security.	• You must separately configure link encryption to protect data. • SQL logs must be separately stored.
O&M capability	• Provides comprehensive database O&M solutions such as backup and restoration, monitoring and alerting, and intelligent O&M diagnostics. • Allows you to deploy additional O&M tools such as proprietary monitoring components. • Grants all database management permissions and controllable OS permissions to database administrators.	• Database administrators must install and deploy databases and set up high-availability, backup, and monitoring components themselves. • Senior database administrators are required to perform database O&M.
Elasticity	• Allows you to create instances of the same specifications. • Allows you to adjust the resource allocation ratio and select instance families to meet your business requirements. • Allows you to configure different specifications for primary instances, secondary instances, and shards in distributed databases to meet your business requirements.	Resource scaling is a tough task.

6.Scenarios

This topic describes the application scenarios of .

Typical scenarios

- Scenario 1: ensures data compliance and security by protecting your data against external and internal security threats to the cloud platform. ApsaraDB MyBase isolates your resources from the resources of other users.
- Scenario 2: meets extremely high performance requirements. Assume that you need to use dedicated physical resources and connect to existing monitoring and O&M systems. You can maintain your database O&M experience and add instance resources to cope with peak-hour traffic. For more information, see Configure elastic scaling for instances to handle traffic spikes.
- Scenario 4: helps you improve the CPU and storage utilization and reduce the costs of using cloud-based databases. For more information, see Configure resource overcommitment to reduce costs.

Use cases

- Use case 1

  Problem description:

  If you use other ApsaraDB services, some of your resources are not used when the loads are low. This results in a low resource utilization rate and is not cost-effective.

  Solution:

  Use to create multiple overcommitted hosts of the same specifications for your instances. This improves CPU utilization and reduces resource costs. For more information, see Configure resource overcommitment to reduce costs.

- Use case 2

  Problem description:

  During online shopping festivals, such as 618 and Double 11, you may need to upgrade the specifications of your instances to improve performance. However, the specifications cannot be downgraded after these events. This increases costs.

  Solution:

  The elastic scaling feature allows you to upgrade instance specifications to improve performance for a short period of time. The instance specifications include memory and CPU. After the specified period of time ends, ApsaraDB MyBase automatically restores the instance specifications to the status before the elastic scaling. For more information, see Configure elastic scaling for instances to handle traffic spikes.

7.Terms

This topic introduces the basic concepts of .

Term	English	Description
Region	Region	The geographic location of a data center. You must specify a region when you create a host or a database instance. You cannot change the region after the creation.
Zone	Zone	A physical area where an independent power grid and an independent network are provided within a region. The network latency between instances within the same zone is shorter than that between instances in different zones.
	Dedicated Cluster	A cluster that consists of multiple hosts in the same region. A dedicated cluster provides you exclusive resources. You can deploy multiple database instances in a dedicated cluster. Hosts in a dedicated cluster can reside in different zones but cannot reside in different regions. For more information, see Create a dedicated cluster.
Host	Host	A virtual server. For more information, see Create a host.
Instance	Instance	An instance is a virtual database server. You can create and manage multiple databases in an instance. For more information, see Create an instance.
Image	Image	Provides the operating system of a host. The Linux and Windows Server operating systems are supported.
Virtual private cloud (VPC)	Virtual Private Cloud	A logically isolated private network that is deployed based on Alibaba Cloud. You can configure private IP address ranges, routing tables, and gateways for VPCs.