Alibaba Cloud
Elastic Compute Service

Quick Start for Enterprise-Level Users

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Generic conventions

Table -1: Style conventions

Style	Description	Example
⛔	This warning information 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.
⚠️	This warning information 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 restore business.
📋	This indicates warning information, supplementary instructions, and other content that the user must understand.	① Notice: Take the necessary precautions to save exported data containing sensitive information.
	This indicates supplemental instructions, best practices, tips, and other content that is good to know for the user.	📋 Note: You can use Ctrl + A to select all files.
>	Multi-level menu cascade.	Settings > Network > Set network type
Bold	It is used for buttons, menus, page names, and other UI elements.	Click **OK**.
`Courier font`	It is used for commands.	Run the `cd  / d   C :/ windows` command to enter the Windows system folder.
Italics	It is used for parameters and variables.	`bae   log   list  -- instanceid` *`Instance_ID`*
[] or [a|b]	It indicates that it is a optional value, and only one item can be selected.	`ipconfig` *`[-all|-t]`*

Style	Description	Example
{} or {a|b}	It indicates that it is a required value, and only one item can be selected.	`swich` *{stand | slave}*

Contents

1 Overview

Quick start process

When purchasing and using Elastic Compute Service (ECS) instances, as an enterprise -level user, you must finish the following operations:

· Select configurations.

· Estimate costs.

· Plan networks.

· Configure a security group.

· Automatic snapshot policies.

· Image migration.

· Implement high availability by using Server Load Balancer.

Target readers

The Quick Start is a reference for anyone who wants to know how to:

· Select configurations for ECS instances.

· Estimate costs of a large-sized instance and specific configuration.

· Perform network planning for a specific solution.

· Configure the security group information for each instance.

· Select and develop better snapshot policies.

· Complete image migration.

Locate resources

Procedure	Interface	Parameter	Target data
1. Query regions.	DescribeRegions	N/A	Region ID (RegionId)
2. Query zones.	DescribeZones	Region ID	Zone ID (ZoneId)
3. Determine the billing method.	DescribeZones	Billing method/ Bidding policy	ZoneType
4. Query resource combinations.	DescribeZones	RegionId/Billing method	ZoneType

This document is applicable only to operations performed in the console. If you are an API user, see API references.

2 Select configuration

An enterprise-level user can select configurations by following the process.
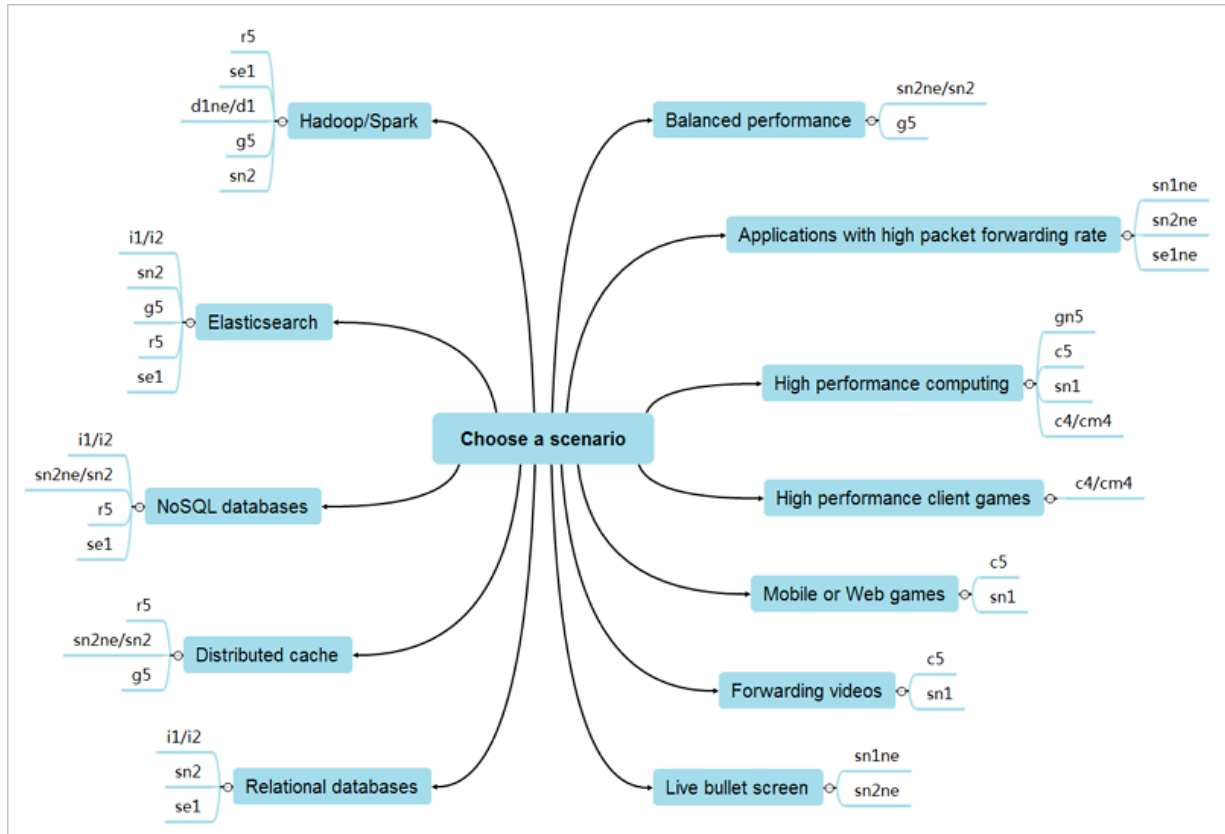
> 📋 **Note:**
>
> For more information about the instance types, see instance generations and type families.

As an enterprise-lever user of ECS, you may have specific requirements. To meet your requirements, Alibaba Cloud provides you with recommendations for instance configuration in the following scenarios:

- Balanced performance

  A balanced CPU to memory ratio is required to meet the application resource requirements in most scenarios.

- Applications with high packet forwarding rate

  High packet forwarding rate is required. You can select a more reasonable computing capacity to memory resource ratio based on the specific scenarios.

- High performance computing

  Many computing resources are required. GPU parallel computing and a high clock speed are typical applications in this scenario.

- High-performance client games

  Your services require a high-frequency processor to carry more users. Therefore, a high clock speed is required in this scenario.

- Mobile and Web games

  Many computing resources are required for this scenario. A CPU to memory ratio of 1:2 can help achieve optimal cost performance of computing resources.

- Video forwarding

  Many computing resources are required for this scenario. A CPU to memory ratio of 1:2 can help achieve optimal cost performance of computing resources.

- Live bullet screen

  High packet forwarding rate is required for this scenario. You can select a more reasonable computing capacity to memory resource ratio based on the specific scenarios.

- Relational databases

  In this scenario, SSD cloud disks or higher-performance NVMe SSD local disks are required to provide higher IOPS capability and a low read latency. The CPU to memory ratio is balanced (1:4) or the memory proportion is larger (1:8).

- Distributed cache

  In this scenario, a balanced CPU to memory ratio (1:4) or a higher memory proportion (1:8), and stable computing performance are required.

- NoSQL databases

  In this scenario, SSD cloud disks or higher-performance NVMe SSD local disks are required to provide higher IOPS capacity and a low read latency. The CPU to memory ratio is balanced (1:4) or the memory proportion is larger (1:8).

- Elastic search

  In this scenario, SSD cloud disks or higher-performance NVMe SSD local disks are required to provide higher IOPS capacity and a low read latency. The CPU to memory ratio is balanced (1:4) or the memory proportion is larger (1:8).

· Hadoop

Data nodes require a high disk throughput, high network throughput, and
balanced CPU to memory ratio. Computing nodes focus more on the computing
performance, network bandwidth, and CPU to memory ratio.

· Spark

Data nodes require a high disk throughput, high network throughput, and
balanced CPU to memory ratio. Computing nodes focus more on the computing
performance, network bandwidth, and CPU to memory ratio.

· Kafka

Data nodes require a high disk throughput, high network throughput, and
balanced CPU to memory ratio. Computing nodes focus more on the computing
performance, network bandwidth, and CPU to memory ratio.

· Machine learning

In this scenario, a high performance Nvidia GPU computing processor is required,
and the memory size must be at least twice the video memory.

· Video encoding

In this scenario, a high performance GPU computing processor or a high
performance CPU is required for encoding and decoding.

· Rendering

In this scenario, a high performance GPU computing processor is required for
rendering.

3 Design VPCs

This topic describes how to design Virtual Private Clouds (VPCs), determine the number of the VPCs and VSwitches you may require for your services, and how to select private CIDR blocks. VPCs have several advantages because they run in an isolated network environment, and therefore can be useful for a number of applications.

Determine the number of VPCs

When a VPC is created, it can only be used in one region. Therefore, you may need to create more than one VPC. This is especially the case if you have one or more of the following service requirements:

· You want to deploy a business system across multiple regions.

· You want to isolate multiple business systems. For example, you want to isolate a production environment from a test environment.

> Note:
> You can run up to 15,000 cloud product instances with one VPC.

Determine the number of VSwitches

· Lower quantity limit

    The minimum number of VSwitches deployed must be 2. You must deploy at least two VSwitches in different zones to allow for cross-zone disaster tolerance.

· Network latency

    The network latency between different zones in the same region is low. However, unexpected latency increases may occur due to complicated system calls, system processing, and cross-zone calls. As such, we recommend that you optimize and adapt your business system to strike a balance between high availability and low latency.

· System isolation

    The number of VSwitches used varies depending on the system capacity and design of the VPC. If your front-end systems can communicate with the Internet, you can deploy each front-end system under a unique VSwitch. By doing so, you can restore

an application on an alternate cluster when the primary cluster fails and deploy backend systems under other Vswitches.

Select private CIDR blocks

- If you use multiple VPCs or want to deploy a hybrid cloud in which your VPCs can communicate with your local Internet data center (IDC), we recommend that you use the subnets of standard private CIDR blocks as your VPC CIDR blocks. You may use up to 16 masks.
- If you use only one VPC that does not communicate with your local IDC, you can select any standard private CIDR block or its subnet as your VPC CIDR block.
- If you use both a VPC and a classic network and plan to connect the VPC with the ECS instances on the classic network by using ClassicLink, we recommend that you select a CIDR block other than 10 . 0 . 0 . 0 / 8 as your VPC CIDR block. 10 . 0 . 0 . 0 / 8 is the CIDR block for the classic network. For more information about ClassicLink, see ClassicLink overview.

The following table lists standard private CIDR blocks and the number of available IP addresses on each block.

> **Note:**
> The IP addresses that are occupied by your business systems are excluded from the IP addresses available on each CIDR block.

Private CIDR block	Number of available IP addresses
192.168.0.0/16	65532
172.16.0.0/12	1048572
10.0.0.0/8	16777212

> **Note:**
> - After a VPC is created, its CIDR blocks cannot be modified.
> - If you require other special CIDR blocks, open a ticket at Open Ticket or contact your customer manager.

For more information, see Plan and design VPC in the *Virtual Private Cloud* documentation.

4 Estimate costs

As an enterprise-level user, once you select the instance type and have completed the
network planning, you can estimate the costs based on the following factors: billing
methods, regions, images, networks, and quantity.

Billing methods

Now, the following billing methods are available to an enterprise-level user, including
Subscription, Pay-As-You-Go, and preemptible instances.

- Subscription: Subscription is a type of prepayment whereby instances can be used
  only after you make the payment. Instances are charged on a monthly basis, and
  the unit is USD/month. This billing method is applicable to fixed 24/7 services,
  such as the Web service.

- Pay-As-You-Go: Pay-As-You-Go is a type of post payment whereby payment can be
  made after you use the resources. Instances are billed by second and settled by
  hour. The unit is USD/hour . This billing method is applicable to scenarios with
  traffic volume spikes, such as temporary scaling, interim testing, and scientific
  computing.

- Preemptible instance: To reduce the ECS computing cost, you can select a
  preemptible instance. As an instance on demand, you must set the maximum
  hourly rate you want to pay for your expected instance type. When your bid is
  higher than the current market price, your instance runs. The final price you pay
  for the instance type is based on the current market price. For more information,
  see preemptible instances.

Advantages of each billing method vary according to the instance type. For more
information, see ECS product pricing.

Regions

When selecting a region, you must consider the following factors:

- Region of the instance and the geographical location of your target users
- Relationship between ECS and other Alibaba Cloud products
- Resource price
- Special requirements of some regions. For example, to use an ECS instance as a
  Web server in mainland China, your business license must be filed for record.

> **Note:**
> The price for the same instance type may vary according to the region. For more information about the specific prices, see ECS product pricing.

Images

The price varies according to the image type:

- Public images: The price varies with the region.
- Shared images: The price of the custom image shared with you by other accounts is based on the source image.
- Custom images: The price is based on the source image.

Networks

After completing network planning of the general solution, you must select a specified VPC and switch.

> **Note:**
> Before purchasing an instance, you must create a VPC and a switch in advance.

When selecting a specific network, the selected VPC and switch are free of charge.

- If you want to allocate a public IP address, you can set the peak bandwidth . Different fees are charged based on the selected bandwidth. If the selected public bandwidth is 0 Mbit/s, no public IP address is allocated by default.

  > **Note:**
  > The allocated public IP addresses cannot be unbound from their ECS instances.

- If you choose not to allocate public IP addresses and you need a static public IP address solution with greater flexibility, we recommend that you do not allocate a public IP address. Then, configure and bind an EIP address. For more information about the fees if you choose to configure an EIP, see #unique_22.

Quantity

If you purchase more ECS instances, the cost rises.

5 Configure a security group

A security group is a virtual firewall that is used to control the ECS outbound and inbound traffic.

Within the same VPC, ECS instances in the same security group can communicate with each other over the intranet. By default, ECS instances under different VSwitches in a VPC can access each other by using system routes. You can configure the security group rules to isolate the instances from one another. For more information, see isolate the subnets in a VPC.

Default security group rules

When you create a VPC ECS instance, you can add the instance into a default security group provided by the system, or select other existing security groups in the VPC. For more information about the rules of a default security group, see default security group rules.

Configure security groups

After you have the network plan, you can configure the security groups. For more information about how to add a security group, see #unique_25.

For more information about the scenarios of security groups, see #unique_26.

6 Configure automatic snapshot policies

A snapshot is a copy of the data of an ECS instance at a specified point in time. A snapshot can be used to back up data and create custom images.

Time settings

Each account can create up to 100 automatic snapshot policies in a region. For more information about how to create automatic snapshot policies, see #unique_28. You can set the following time-related parameters for an automatic snapshot policy:

· Executed At: Specify the hours of the day to create snapshots. Valid values: 00:00 to 23:00.

· Execution Frequency: Specify the days of the week to create snapshots. Valid values : Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, and Sunday.

· Keep Snapshots: Specify the period of time to retain snapshots. Snapshots can be retained permanently or for a specified period of time (1 to 65,536 days). The default retention period is 30 days.

Time when snapshots are created

Automatic snapshots are created at the time specified in the automatic snapshot policy. Creating snapshots may degrade the I/O performance of a disk for a short period of time. When you set the Executed At and Execution Frequency parameters , we recommend that you avoid traffic peak periods based on characteristics of your business to ensure normal service running.

Retention period

You can set the snapshot retention period based on business characteristics and the data update cycle. The snapshot retention period and the number of snapshots are mutually related. If the snapshot quota is exhausted, the earliest automatic snapshot is deleted.

Snapshot costs

Snapshots are charged based on the storage space they occupy. As more snapshots are stored, a larger storage space is occupied, increasing the cost. For more information about how to reduce snapshot costs, see #unique_29.

Related topics

This topic only applies to automatic snapshot policies. You can also manually create
snapshots at any time. For more information, see #unique_30. Manually created
snapshots are retained continuously. If you no longer require a manually created
snapshot, you need to manually delete it.

7 Image migration

Feasibility

Before migrating an image, you must conduct a survey on the server to be migrated and evaluate whether image migration is used and whether this operation is feasible.

· If the number of servers to be migrated is large, most servers contain system disks , and network conditions are unfavorable, image migration is not recommended. Image files are large, and image migration performed under such conditions may increase the migration time and labor costs.

· If the application configurations on the servers to be migrated are complicated and not manually maintained, and network conditions are favorable, image migration is recommended. Although data disks do not support image migration, you can migrate images of system disks to Alibaba Cloud, and then synchronize data of data disks to data disks of Alibaba Cloud by means of file synchronization.

Migration tools

Alibaba Cloud Migration Tool, or Cloud Migration Tool for short, is a proprietary resource migration tool of Alibaba Cloud.

It supports resource migration, such as the operating system, applications, and application data in a computer disk, of physical machines, VMs (virtual machines), or cloud hosts to the image list in the ECS. Being lightweight and handy, Alibaba Cloud Migration Tool helps you balance the workload between your local and cloud hosts, or cloud hosts from different cloud platforms. For more information, see what is Alibaba Cloud Migration Tool.

Procedure

To migrate an image, follow these steps:

1. Prepare for the migration.

   · Prepare for the migration.

   · Prepare the image format conversion tools and platforms.

   · Check and prepare the operating system before exporting image files.

2. Migrate your on-premises server. For more information, see migrate to Alibaba Cloud by using Cloud Migration Tool.

3. **Start ECS instances based on images. You can go to the ECS console page, and
    create instances based on the new image files.**

8 Implement high availability by using Server Load Balancer

Server Load Balancer is a traffic distribution control service that distributes traffic to multiple backend ECS instances based on the forwarding policies.

Scenarios

In the following scenarios, you can use Server Load Balancer to greatly improve high availability of ECS instances.

· High-traffic services

If traffic of an application is high, you can configure monitoring rules to distribute traffic to different ECS instances. In addition, you can use the session persistenc e function to forward requests from the same client to the same backend ECS instance to improve access efficiency.

· System extension

Based on the business development requirements, you can add or remove ECS instances at any time to extend the service capability of application systems and adapt to various Web servers and application servers. For more information, see #unique_35.

· Eliminate a single-point of failures

You can add multiple ECS instances behind a Server Load Balancer instance. When some ECS instances are faulty, Server Load Balancer automatically shields faulty ECS instances and distributes requests to healthy ECS instances, guaranteeing that the application systems can still work normally.

· Intra-city disaster tolerance (multi-zone disaster tolerance)

You can deploy the Server Load Balancer instances in a region with multiple zones to implement intra-city disaster tolerance. With this feature, when one data center fails, Server Load Balancer can quickly switch front-end traffic to other zones in the same region to restore the service capability.

> 📋 Note:
> If at least one ECS instance is added for each zone, the efficiency of Server Load Balancer is the highest in this deployment mode.

· Cross-region disaster tolerance

You can deploy the Server Load Balancer instances in different regions, and attach
ECS instances of different zones in the corresponding regions. The upper layer
uses Alibaba Cloud DNS as intelligent DNS, and resolves domain names to service
addresses of Server Load Balancer instances in different regions, thus implementi
ng global load balancing. When the system becomes unavailable in a region, you
can temporarily stop DNS so that access of all users is not affected.

Preparations

Before using Server Load Balancer, make the following preparations.

· Plan regions where the Server Load Balancer instances are deployed

Alibaba Cloud provides Server Load Balancer for all the regions.

> **Note:**
> - To reduce the latency and increase the download speed, we recommend that
>   you select the region closest to your customers.
> - As Server Load Balancer does not support cross-region deployment, plan
>   regions and select the same region as the backend ECS instance.

· Select the type (public or private network) of the Server Load Balancer instance

Determine the Server Load Balancer instance type based on your service type.
After a Server Load Balancer instance is created, the system allocates a public or
private IP address based on the type of the Server Load Balancer instance.

- Public network Server Load Balancer instances are only assigned public IP
  addresses. These Server Load Balancers are accessible over the Internet.

- Private network Server Load Balancer instances are only assigned private IP
  addresses. Server Load Balancer is accessible only over the Alibaba Cloud
  intranet, but not over the Internet. No fee is charged for private network Server
  Load Balancer instances.

· Select listening protocols

Server Load Balancer supports Layer-4 (TCP and UDP) and Layer-7 (HTTP and
HTTPS) listening.

- During Layer-4 listening, requests are directly forwarded to the backend server
  and headers are not modified. After requests of clients arrive at the Server Load

Balancer listener, the Server Load Balancer servers establish TCP connections
with backend ECS instances through the backend ports configured for listening.

- In principle, Layer-7 listening is a way of implementing reverse proxy. After
   requests of clients arrive at the Server Load Balancer listener, the Server Load
   Balancer servers establish TCP connections with the backend ECS instances,
   namely to access the HTTP backend servers through the new TCP connections
   again instead of directly forwarding packets to the backend ECS instances.

Compared with Layer-4 listening, Layer-7 listening requires an extra step of
Tengine processing. Therefore, the performance of Layer-7 listening is not as good
as that of Layer-4 listening. In addition, Layer-7 listening performance may be
deteriorated by such factors as insufficient number of client ports and too many
backend server connections. If high performance requirements are raised, Layer-4
listening is recommended.

· Prepare backend servers

Add ECS instances behind a Server Load Balancer instance to process requests
forwarded by the front-end listener. Before creating a Server Load Balancer
instance, create ECS instances and deploy related applications. When creating an
ECS instance, note the following items:

- Region and zone of the ECS instance

   Make sure that the region of the ECS instance is the same as that of the Server
   Load Balancer instance. In addition, we recommend that you deploy ECS
   instances in different zones to improve the local availability.

- ECS configuration

   After deploying applications on the ECS instances, you do not have to perform
   special configuration. However, to configure a Layer-4 listener (TCP or UDP)
   for Linux ECS instances, make sure that the following parameters in the
   net.ipv4.conf file are set to 0:

   ```
   net . ipv4 . conf . default . rp_filter  =  0
   net . ipv4 . conf . all . rp_filter  =  0
   net . ipv4 . conf . eth0 . rp_filter  =  0
   ```

- ECS instance deployment

   Now, no quota is set for backend ECS instances that can be configured for a
   Server Load Balancer instance. However, to guarantee stability and efficiency of
   your external services, we recommend that you add ECS instances of applicatio

n servers that provide different services or perform different tasks to different
Server Load Balancer instances based on service types or application modules.

Procedure

1. Create ECS instances. You must have at least two ECS instances to use the Server
   Load Balancer service. For more information, see #unique_36.

2. After the ECS instances are created, deploy related applications on the ECS
   instances.

3. Create a Server Load Balancer instance. A Server Load Balancer instance can be
   mapped to multiple listeners and backend servers. For more information, see
   #unique_37.

4. After the Server Load Balancer instance is created, add at least one listener and
   one group of backend servers behind it. For more information, see #unique_38.

Billing description

Server Load Balancer supports PayByTraffic. The specific charging items vary
according to the instance type and performance type. For more information, see
Pricing.