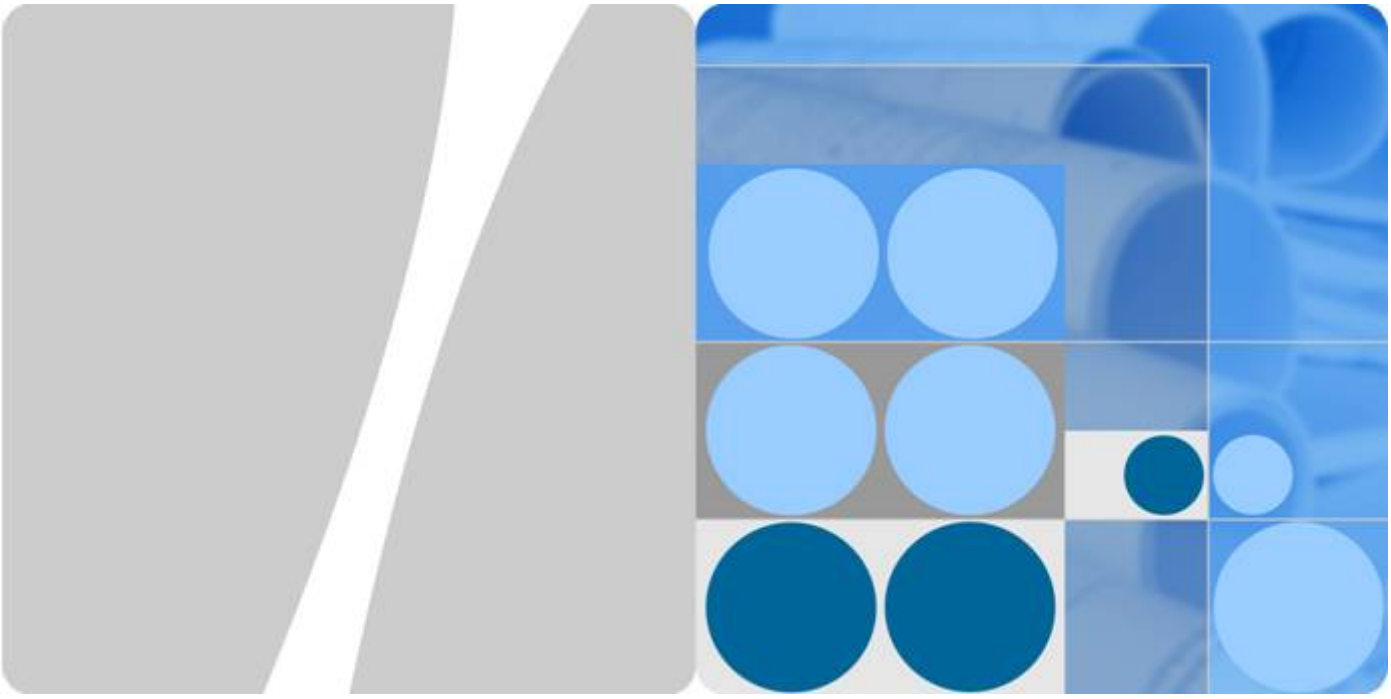


Server Migration Service

User Guide

Date **2023-11-30**

Contents

1 Service Overview 1
1.1 What Is SMS? 1
1.2 SMS Functions 2
1.2.1 Migration Feasibility Check 2
1.2.2 Migration and Synchronization for Windows 2
1.2.3 Migration and Synchronization for Linux 2
1.2.4 Dynamical Secure Transmission Channel 3
1.3 SMS Advantages 3
1.4 Related Services 4
1.5 Precautions 4
1.5.1 Constraints 4
1.5.2 Supported OSs 6
1.5.2.1 Supported Windows OSs 6
1.5.2.2 Supported Linux OSs 7
1.5.3 Disclaimer 10
1.6 Service Agreement 11
1.7 Billing 15
1.8 Permissions Management 16
2 Getting Started 18
2.1 Quick Start 18
2.2 Preparing for Migration 18
2.3 Installing the Agent on Source Servers 20
2.3.1 Windows 20
2.3.2 Linux 22
2.4 (Optional) Creating a Migration Template 23
2.5 (Optional) Creating a Server Template 23
2.6 Configuring a Target Server 24
2.7 Starting a Full Replication 30
2.8 Launching a Target Server 31
2.9 Synchronizing Incremental Data 32
3 User Guide 33
3.1 Permissions Management 33

3.1.1 Creating a User and Assigning Permissions 33
3.1.2 SMS Custom Policies 35
3.2 Server Management 36
3.2.1 Configuring a Target Server 36
3.2.2 Starting a Full Replication 43
3.2.3 (Optional) Cloning a Target Server 44
3.2.4 Launching a Target Server 44
3.2.5 Viewing a Server Details 45
3.2.6 Synchronizing Incremental Data 46
3.2.7 Deleting the Target Server Configuration 46
3.2.8 (Optional) Deleting a Cloned Server 47
3.2.9 Deleting a Server 47
3.2.10 Setting the Migration Rate 48
3.2.11 Unlocking a Target Server 48
3.3 Template Management 49
3.3.1 Creating a Migration Template 49
3.3.2 Modifying a Migration Template 52
3.3.3 Deleting a Migration Template 52
3.3.4 Creating a Server Template 52
3.4 Viewing CTS Traces 55
3.4.1 SMS Operations Supported by CTS 55
3.4.2 Viewing Tracing Logs 55
3.5 Creating Custom Agent Images 56
3.5.1 Using Custom Agent Images 56
3.5.2 Creating Scripts in Agent Images 59
3.5.3 Creating a Windows Agent Image 64
3.5.4 Creating a Linux Agent Image 71

4 FAQs 75

4.1 Product Consulting 75
4.1.1 Can I Migrate Physical Servers and VMs from Other Clouds to the Cloud Platform Using SMS? 75
4.1.2 Can I Migrate ECSs to an On-premises Environment or Another Cloud Using SMS? 75
4.1.3 Can I Ask the Technical Support to Help Me Move Servers? 75
4.1.4 Can I Migrate Workloads to a DeH, or DeC Using SMS? 75
4.1.5 Does SMS Support Resumable Data Transfer? 76
4.1.6 How Do I Migrate an ECS from One Account to Another? 76
4.1.7 How Do I Migrate an ECS from One Region to Another Using SMS? 76
4.1.8 Will My Services on the Source Server Be Interrupted During Migration? 76
4.1.9 How Do I Create an AK/SK Pair for an Account? 76
4.1.10 How Do I Create an AK/SK Pair for an IAM User? 77
4.1.11 How Do I Migrate a Linux Source Server as a Non-root User? 78
4.1.12 What Information Does SMS Collect About Source Servers? 78
4.1.13 How Do I Select a Target Server? 81

4.1.14 How Do I Create an ECS?....81
4.1.15 What Is the Block-Level Migration?....82
4.1.16 What are Valid Data Blocks?....82
4.1.17 Why Is the OS Name of the Target ECS Displayed on the ECS Console Different from That of the Source Server?....82
4.1.18 How Do I Determine Whether a Migration Task Is Complete?....83
4.1.19 Can I Migrate Only Some Services on the Source Server?....83
4.1.20 Can the Target Server Run a Different Type of OS from the Source Server?....83
4.1.21 What Determines the Specifications of a Target Server?....83
4.1.22 Which Download Option Should I Choose When I Download the Windows Agent?....83
4.1.23 How Does SMS Differ from IMS in the Migration Scenario?....84
4.1.24 How Do I Display the OS Name of a Target Server on the ECS Console?....84
4.1.25 What Are the Snapshots of a Target Server Used for?....86
4.1.26 In a Linux File-Level Migration, How Do I Exclude Directories from Migration and Synchronization?....86
4.1.27 Will an Incremental Synchronization Overwrite the Existing Data on a Launched Target Server?....88
4.1.28 How Do I Create a Target Server that Meets the SMS Requirements?....88
4.1.29 Can SMS Migrate Self-built Databases, Big Data Services, or Websites Deployed on a Source Server?....89
4.1.30 Can the AK/SK of a Federated User (Virtual IAM User) Be Used for Authentication During the SMS-Agent Startup?....90
4.1.31 How Do I Synchronize Files in Specific Directories After a Linux File-Level Migration Is Complete?....90
4.1.32 Will the Migration Be Affected If the SSH Service Does Not Use Default Port 22 on the Source Server?....90
4.1.33 How Do I Obtain the SMS Domain Name?....90
4.1.34 How Many Resources Will Be Used for a Linux Block-Level Migration?....90
4.1.35 How Do I Disable Data Compression When the CPU Usage Is Too High During a Linux Block-Level Migration?....92
4.1.36 Do I Need to Activate My Windows OS and Paid Software After the Migration?....93
4.1.37 How Do I Set the Number of Concurrent Processes for Linux File-Level Migrations?....93
4.1.38 Which Directories Are Not Synchronized by Default During Incremental Synchronization on a Linux Server?....94
4.1.39 How Do I Verify Data Consistency Between the Source and Target Servers?....95
4.2 OS Compatibility and Migration Restrictions....98
4.2.1 What Source Server OSs Are Supported by SMS and Are There Any Restrictions on Using SMS?....98
4.2.2 What Are the Important Statements of SMS?....103
4.2.3 How Many Servers Can I Migrate Concurrently Using SMS?....104
4.2.4 How Do I Resolve the Error "Inconsistent firmware type. Source: UEFI, Target: BIOS" When I Create a Migration Task?....104
4.2.5 How Do I Resolve Error "Incompatible file system of the source server"?....105
4.2.6 How Do I Resolve Error "Insufficient permissions. Add corresponding fine-grained permissions"?....106
4.2.7 How Do Resolve the Error "Source server lacks driver files"?....106
4.2.8 How Do I Resolve Error "VSS not installed on the source server"?....107
4.2.9 How Do I Check the Firmware Type of a Source Server?....109

4.2.10 Why Can't I Save the Migration Configuration as a Template?..... 109
4.2.11 How Do I Set Resource Limits for SMS-Agent During a Linux Server Migration?..... 110
4.3 Migration Network..... 113
4.3.1 How Do I Set Up a Secure Migration Network for Using SMS?..... 113
4.3.2 How Do I Prepare a Target Server Before the Migration?..... 114
4.3.3 How Do I Configure Security Group Rules for Target Servers?..... 115
4.3.4 How Do I Resolve the Error "Failed to establish an SSH connection with the target ECS"?..... 115
4.3.5 How Do I Fix the Error "Failed to connect to the target ECS. Check whether its IP address is reachable and confirm that port XX is enabled"?..... 117
4.3.6 How Do I Fix a Connection Failure Between the Source Server and API Gateway Due to a Busy Network?..... 119
4.3.7 How Do I Restore the Connection Between the Agent and SMS?..... 119
4.3.8 Why the Migration Progress Is Suspended or Slow?..... 123
4.3.9 Does a Source Server Have to Connect to the Internet?..... 123
4.3.10 Can I Release or Change the Target Server EIP During the Migration?..... 124
4.3.11 How Do I Resolve the Error "SMS.0302 Failed to resolve domain name xxx"?..... 125
4.3.12 How Do I Resolve the Error "SMS.0303 Unable to access domain name xxx"?..... 125
4.4 Migration Duration..... 126
4.4.1 How Long Does a Migration Take?..... 126
4.4.2 How Do I View the Remaining Migration Time?..... 129
4.4.3 How Is the Migration Rate Displayed on the SMS Console Calculated?..... 130
4.4.4 How Do I Speed Up Migration?..... 133
4.4.5 Why Does the Migration Speed Fluctuate?..... 133
4.4.6 How Do I Test the Network Between the Source and Target Servers Using iPerf?..... 133
4.4.7 Why Isn't the Increased Bandwidth Being Used During the Migration?..... 136
4.4.8 Is the Migration Speed Determined by the Source Bandwidth or the Target Bandwidth?..... 136
4.4.9 Why Does the Migration Stay in a Stage for a Long Time? 136
4.4.10 What Factors Affect the Migration Speed?..... 137
4.4.11 Why Is the Linux Block-Level Migration Very Slow?..... 139
4.5 Agent Installation and Startup..... 139
4.5.1 How Do I Install the Agent on Source Servers?..... 139
4.5.2 What Can I Do If I Fail to Download the Agent Installation File?..... 139
4.5.3 How Do I Verify the Integrity of the Agent Installation File?..... 140
4.5.4 Why Wasn't My Source Server Added to the SMS Console After I Configured the Agent?..... 140
4.5.5 How Do I Find and Modify the Agent Configuration Files?..... 141
4.5.6 Where Can I Find the Agent Run Logs?..... 142
4.5.7 Why Is My Target Server Locked During the Migration?..... 142
4.5.8 How Do I Unlock a Target Server Manually?..... 142
4.5.9 How Do I Resolve the "No such file or directory: 'rsync':'rsync" Error When I Start the Linux Agent? 143
4.5.10 How Do I Resolve Error "The application cannot be started due to incorrect parallel configuration" When I Start the Agent? 146
4.5.11 Why Does the Agent Not Start the First Time I Launch It?..... 146

4.5.12 Why Does the Windows Agent Executable Not Run When I Double-Click It?..... 147
4.5.13 How Do I Fix Error "Failed to start the I/O monitoring module" When I Start the Agent?..... 147
4.5.14 How Do I Fix Error "INTERNAL ERROR: cannot create temporary directory!" When I Start the Agent?..... 149
4.5.15 How Do I Resolve Error "AK/SK authentication failed. Ensure that the system time is consistent with the standard time and the AK and SK are correct" When I Start the Agent?..... 150
4.5.16 How Do I Troubleshoot Failures of Pasting the AK/SK Pair When I Start the Agent (Python 2)?... 151
4.5.17 How Do I Resolve Error "utf-8 codec can't decode byte 0xce in position0: invalid continuation byte" When I Start the Agent?..... 152
4.5.18 How Do I Resolve Error "Failed to load wmi" During the Agent Startup?..... 153
4.5.19 How Do I Fix the Agent Startup Failures Due to Agent Files Write or Read Failures?..... 154
4.5.20 How Do I Restart the Agent?..... 154
4.5.21 How Do I Fix Agent Startup Failures Due to Insufficient Space in /tmp on a Linux Source Server? 155
4.5.22 How Do I Fix Error "Agent startup failed because the noexec permission is not allowed on /tmp for SMS Agent. Please remount /tmp without noexec" When I Start the Linux Agent?..... 155
4.5.23 How Do I Resolve Error "Only servers with x86 architecture can be migrated"?..... 156
4.5.24 How Do I Fix Error "Failed to start sms agent! 'disks'" When I Start the Agent on a Linux Source Server?..... 156
4.5.25 How Do I Fix Error "Failed to obtain information about disk *X*" When I Start the Agent on a Linux Source Server?..... 157
4.5.26 How Do I Choose When the System Asks Whether to Disable the Google Services Detected on My Source Server on the Google Cloud?..... 158
4.5.27 How Do I Fix Error "SMS.0410: Failed to obtain NicName/IPAddress information of source server " When I Start the Agent on a Linux Server?..... 159
4.5.28 What Do I Do If the SMS-Agent Fails to Start and Error "SMS.0609 An earlier version of Agent is detected. Please exit the old Agent, uninstall the old Agent completely, and install the latest version" Is Displayed?..... 162
4.5.29 How Do I Fix Error "SMS.5103: Agent startup failed." When I Fail to Start the Agent on a Linux Source Server? Folder /tmp is missing..... 163
4.5.30 How Do I Fix Error "SMS.1353: Bind mount or repeated mount detected on /xxx of the source server" When I Fail to Start the Agent on a Linux Source Server?..... 164
4.5.31 How Do I Fix Error "SMS.1352: Unknown physical volumes detected on the source server" When I Fail to Start the Agent on a Linux Source Server?..... 168
4.5.32 How Do I Fix Error "SMS.1351: Mount point /xxx detected on the source server, which has no free space. Ensure that there is at least 1 MB of space" When I Fail to Start the Agent on a Linux Source Server?..... 169
4.6 Disk Management..... 169
4.6.1 Why Was a 40 GB EVS Disk Added to the Target Server During the Migration?..... 169
4.6.2 Why Can't I Attach the Original System Disk Back to a Target Server?..... 170
4.6.3 How Do I Resolve Error "Disk info in source server has changed, task fail, please delete the task and then restart the agent"?..... 170
4.6.4 How Do I Resize Partitions and Disks When I Migrate a Windows Source Server?..... 171
4.6.5 How Do I Shrink the Disk Partitions on a Source Server Running Windows?..... 173
4.6.6 How Do I Exclude a Partition from Migration in Windows?..... 175
4.6.7 How Do I Fix Error "Failed to modify the configuration files of the target server"?..... 175
4.6.8 How Do I Fix Error "Failed to create snapshot"?..... 176

4.6.9 How Do I Fix Error "Failed to mount partition xxx to directory xxx"?....177
4.6.10 How Do I Troubleshoot a Failed Migration or Synchronization of a Partition?....178
4.6.11 How Do I Fix Error "Failed to create a file on the source server. Cause: /bin/sh: line 0: echo: write error: No space left on device"?....179
4.6.12 How Do I Fix Error "Failed to read /etc/fstab on the source server"?....179
4.6.13 How Do I Resolve Error "Insufficient disks on the Target ECS"?....180
4.6.14 How Do I Resolve Error "SMS.1105 Disk creation failed"?....181
4.6.15 How Do I Resolve Error "Failed to execute df -TH"?....181
4.6.16 What Are the Requirements on Disks on a Target Server?....181
4.6.17 How Can I Migrate a Source Server with a Large System Disk?....182
4.6.18 How Do I Resolve Error "Some disks on the target server are smaller than those on the source server. Select another target server" When I Configure the Target Server?....183
4.6.19 Can SMS Migrate Local Disks on a Source Server?....183
4.6.20 Why Can't I Specify Whether to Migrate a Physical Volume When I Resize Disk Partitions in Linux?....184
4.6.21 Why Can't I Specify Whether to Migrate a Logical Volume When I Resize Disk Partitions in Linux?....184
4.6.22 What Are the Rules for Resizing Volume Groups, Disks, and Partitions?....185
4.6.23 How Do I Migrate a Server with a System Disk Larger Than 1 TB?....186
4.6.24 How Do I Detach the Temporary System Disk from My Target Server and Re-attach the Original Disk?....187
4.6.25 Why Is There Less Data on the Target Server After the Migration Than There Was on the Source Server?....188
4.6.26 How Do I Merge Disks During a Linux Migration?....190
4.6.27 How Do I Split a Disk During a Linux Migration?....192
4.7 Migration or Synchronization Failures....194
4.7.1 After the Migration Is Complete, How Do I Replicate Any New Data from the Source Server to the Target Server?....194
4.7.2 How Do I Fix the Error "The migration module stops abnormally and cannot synchronize data"?....194
4.7.3 What Do I Do If the SMS-Agent Exits Suddenly and Disconnects a Windows Source Server from the SMS Console During a Migration?....194
4.8 Target Server Configuration and Launch....197
4.8.1 What Are the Differences Between Target and Source Servers After the Migration?....198
4.8.2 How Will the Authentication of a Target Server Change?....200
4.8.3 How Do I Optimize a Windows Target Server After the Migration Is Complete?....200
4.8.4 How Do I Fix the Error "SMS.1113 Failed to reconfigure partition details on the target server" When I Launch the Target Server?....201
4.8.5 After a Windows Server Was Migrated, Why Is the Used Space of C: Drive Increased?....201
4.8.6 How Do I Uninstall the SMS-Agent from the Source and Target Servers After the Migration Is Complete?....203
4.8.7 Why Is the File System Size Inconsistent Before and After the Migration?....203
4.8.8 Why Can't I See Data Disks on a Windows Target Server After Migration?....205
4.8.9 Why Can't a Windows Target Server Access the Internet After the Migration?....207
4.8.10 Why Is the System Recovery Options Window Displayed When the Target Server Is Started?....208
4.8.11 How Do I Expand the Capacity of a Windows System Disk After the Migration?....209

4.8.12 How Do I Fix a GRUB Error Because an XFS Volume Is Mounted to the /boot Partition?..... 212
4.8.13 What Do I Do If a Target Server Fails to Be Created?..... 213
4.8.14 How Do I Troubleshoot a MySQL Startup Failure on the Target Server After the Migration?.....214
4.8.15 How Do I Resolve Error "SELinux targeted" When I Start a Linux Target Server After the Migration Is Complete?..... 214
4.8.16 Why Do the Agent Plug-ins from the Source Cloud Service Provider Exist on the Target Server After the Migration Is Complete?.....215
4.8.17 Why Is the Usable Memory (RAM) Less Than the Total Installed Memory on a Target Server Running 64-bit Windows?..... 216
4.8.18 How Do I Fix Error "Failed to execute boot loader on the target ECS" When I Launch the Target Server?..... 216
4.8.19 After the Migration Is Complete, Will Deleting the Target Server Configuration or Server Record Affects the Source or Target Server?..... 217
4.8.20 How Do I Fix BSOD Errors When I Start a Windows Target Server After the Migration?..... 217
4.8.21 If I Change the Password of the Source Server and Perform an Incremental Replication After the Full Migration Is Complete, Will the New Password Be Synchronized to the Target Server?.....218

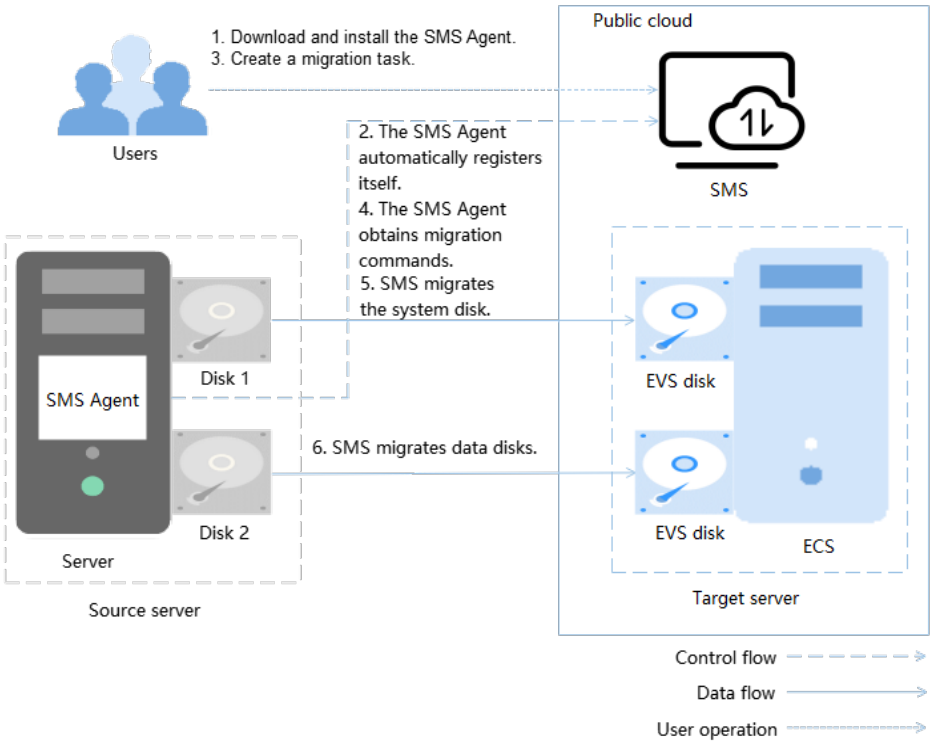
5 Change History..... 220

1 Service Overview

1.1 What Is SMS?

Server Migration Service (SMS) helps you migrate applications and data from x86 physical or virtual servers on premises or in another private cloud or cloud platform to Elastic Cloud Servers (ECSs) on the cloud platform.

Figure 1-1 How SMS works



How SMS works

You only need to perform steps **1** and **3**, and SMS takes care of the other steps automatically.

1. Install the Agent on the source server.
2. The Agent registers its connection status with SMS and reports the information about the source server to SMS. Then, SMS evaluates migration feasibility.
3. Create a migration task.
4. The Agent receives and executes the migration commands sent by SMS.
5. SMS migrates the system disk of the source server.
6. SMS migrates data disks of the source server.

NOTE

- **Source server** is a x86 physical server or VM running on-premises or on other cloud that you want to migrate.
- **Target server** is the ECS you select when creating the migration task. The target server takes over the migrated data and applications. During the migration, data on the source server is transmitted based on the migration policy and overwrites the existing data on the target server.
- **SMS** is the SMS service.

1.2 SMS Functions

1.2.1 Migration Feasibility Check

After you install the Agent on a source server and the Agent is authenticated using the access key ID (AK) and secret access key (SK) of your cloud platform account, the Agent automatically reports the information about the source server to SMS. SMS validates the source server information and determines whether the source server can be migrated. You can view the check results on the **Source Check** tab page of the source server.

1.2.2 Migration and Synchronization for Windows

After the source server passes a migration feasibility check, you can start the migration on the SMS console. When the migration starts, the Agent on the source server receives migration commands from SMS and executes the migration. During execution, the Agent validates blocks in the source server disk partitions and migrates the valid blocks to the corresponding partitions on the target server. After the migration is complete, the Agent automatically starts a continuous incremental synchronization. In this stage, as long as it is not during peak hours, you can stop services running on the source server and cut over the services to the target server.

1.2.3 Migration and Synchronization for Linux

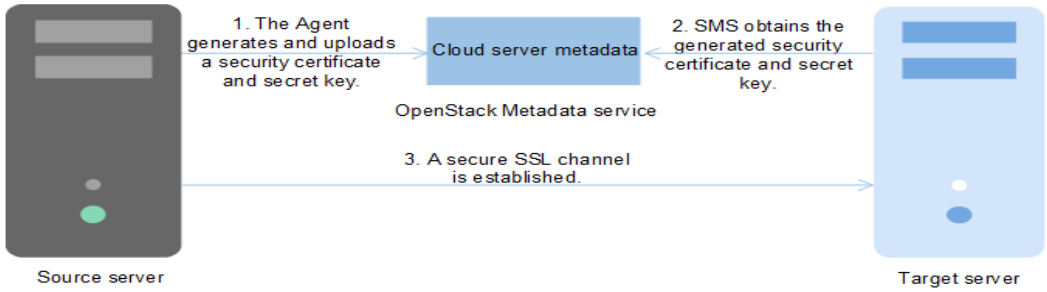
After the source server passes a migration feasibility check, you can start the migration on the SMS console. When the migration starts, the Agent on the source

server receives migration commands from SMS and executes the migration. During execution, the Agent migrates directories and files from the source server to the target server. After the migration is complete, the Agent automatically starts a continuous incremental synchronization. In this stage, as long as it is not during peak hours, you can stop services running on the source server and cut over the services to the target server.

1.2.4 Dynamical Secure Transmission Channel

After the Agent on the source server receives the migration commands from SMS, the Agent dynamically generates a security certificate and secret key and transmits them to the target server through the OpenStack Metadata service. The target server then restarts and establishes a secure SSL channel to the source server using the newly generated certificate.

Figure 1-2 Secure transmission channel



1.3 SMS Advantages

- Ease of use
  - You only need to install and configure the Agent on the source server, configure the target server and start the migration, and launch the target server when the migration is in the **Continuous sync** state. SMS takes care of the remaining works.
  - You can start the migration in only three steps: select the source server and target server, configure server details, and confirm migration information.
- Seamless migration

  You can maintain service running through out the full migration process.
  - If you choose not to perform a continuous synchronization after the full migration, you only need to pause services briefly before the final synchronization. After the final synchronization is complete, you can start services on the target server immediately. This minimizes the service downtime.
  - If you choose to perform a continuous synchronization after the full migration, you only need to stop services temporarily before launching the target server. This minimizes the service downtime.
- Robust compatibility
  - SMS can migrate x86 virtual and physical servers on premises or in many popular clouds.

  - SMS allows migration of over 90 different operating systems (OS) and distributions.
- Fast transmission

  The migration network utilization reaches above 90%.
- High security
  - SMS authenticates the Agent using an AK/SK pair.
  - SMS uses a dynamically generated SSL certificate and key pair to encrypt the transmission channel for data security.

1.4 Related Services

Table 1-1 Related services

Service	Interaction	Reference
ECS	SMS migrates systems, applications, and data from source servers to ECSs on the cloud platform.	**How Do I Create an ECS?**
Elastic IP (EIP)	SMS allows you to use a public network for migration. An EIP must be configured for your target server.	**How Can I Configure Network Security for SMS?**
Virtual Private Cloud (VPC)	Before creating a migration task, you need to configure the security group of the VPC where the target server is located.	**How Can I Configure the Security Group Rules for Target Servers?**
Elastic Volume Service (EVS)	After a migration task is created and started, SMS will create a temporary EVS disk which will be deleted after the migration is complete.	N/A

1.5 Precautions

1.5.1 Constraints

Table 1-2 lists the constraints and limitations on source servers for using SMS.

Table 1-2 Constraints and limitations on source servers

Item	Description
Source server quantity	A user can migrate a maximum of 1,000 source servers concurrently. Delete the migrated servers from the server list in a timely manner so that other servers can continue to be migrated.
OS	• The Windows OSs supported by SMS are all listed in **Supported Windows OSs**. • The Linux OSs supported by SMS are all listed in **Supported Linux OSs**. • A server running multiple OSs cannot be migrated.
Available disk space	• Windows: – At least 320 MB available space on a partition not smaller than 600 MB – At least 40 MB available space on a partition smaller than 600 MB • Linux: At least 200 MB of available space on the root partition
File system	• Windows: Only NTFS partitions are supported. • Linux: Only ext2, ext3, ext4, VFAT, XFS, and Btrfs file systems are supported.
Shared file system	SMS does not support the migration of files from shared file systems such as NFS or CIFS, or from NAS devices.
Encrypted file	OSs that contain protected folders and encrypted volumes cannot be migrated.
Servers that run multi-node databases and Active Directory Domain Services (AD DS)	SMS cannot migrate servers that host active directories or multi-node databases.
Applications bound to hardware	SMS does not support the migration of OSs that contain applications bound to hardware.
Dynamic disk	In Windows, dynamic disks are migrated as basic disks. After the migration is complete, the target server will not have dynamic disks.
Servers added to a domain	If you want to migrate a server added to a domain, after the migration is complete, the target server must be added to that domain.
External storage of servers	External storage attached to a source server cannot be migrated.

Item	Description
Data of database applications and domain controller applications	SMS cannot migrate data of active directories, database applications, and domain controller applications.
Servers with system volumes not on the first disks	SMS does not support the migration of servers whose system volumes are not on the first disks.
Thin-provisioning volumes tagged with pool in LVM	SMS does not support migration of thin volumes tagged with pool.
Servers with RAID arrays	SMS does not support migration of servers with RAID arrays.
GPU servers	SMS does not support the migration of GPU servers.

1.5.2 Supported OSs

1.5.2.1 Supported Windows OSs

The following table lists the Windows OSs supported by SMS.

If you want to migrate a source server that runs an OS not supported by SMS, use any of the following methods:

- Use a public image on the cloud platform to create a server and deploy source server applications on the target server. With this method, there is no need for you to migrate source servers.

Table 1-3 Supported Windows OSs

OS	Bit	UEFI	Remarks
Windows Server 2008	64	No	Windows Server 2008 and Windows Server 2008 R2 fail to boot in UEFI mode.
Windows Server 2008 R2	64	No	
Windows Server 2012	64	Yes	N/A
Windows Server 2012 R2	64	Yes	
Windows Server 2016	64	Yes	

OS	Bit	UEFI	Remarks
Windows Server 2019	64	Yes	
Windows 7	64	No	
Windows 8.1	64	No	
Windows 10	64	Yes	

1.5.2.2 Supported Linux OSs

SMS supports file-level migration for Linux.

- Table 1-4 lists the Linux OSs supported by SMS for file-level migration.

  If the source server runs an OS that is not supported by SMS, use any of the following methods:

  – Use a public image on the cloud platform to create a server and deploy source server applications on the target server. With this method, there is no need for you to migrate source servers.

Table 1-4 Linux OSs supported by file-level migration

OS	Version	Bit	UEFI Support	Remarks
Red Hat	Red Hat Enterprise Linux 6.0 (Only KVM servers are supported.)	64	No	-
	Red Hat Enterprise Linux 6.1/6.2/6.3/6.4/6.5/6.7/6.8/6.9/6.10	64	No	
	Red Hat Enterprise Linux 7.0	64	No	
	Red Hat Enterprise Linux 7.1/7.2/7.3/7.4/7.5/7.6/7.7/7.8/7.9	64	Yes	
	Red Hat Enterprise Linux 8.0/8.1/8.2/8.3/8.4/8.5/8.6	64	Yes	
	Red Hat Enterprise Linux 9.0	64	Yes	
CentOS	CentOS 6.0 (Only KVM servers are supported.)	64	No	-
	CentOS 6.1/6.2/6.3/6.4/6.5/6.6/6.7/6.8/6.9/6.10	64	No	
	CentOS 7.0	64	No	

OS	Version	Bit	UEFI Support	Remarks
	CentOS 7.1/7.2/7.3/7.4/7.5/7.6/7.7/7.8/7.9	64	Yes	
	CentOS 8.0/8.1/8.2/8.3/8.4/8.5	64	Yes	
	CentOS Stream 8	64	Yes	This distribution will be identified as CentOS 8.0. This does not affect the migration.
	CentOS Stream 9	64	Yes	This distribution will be identified as CentOS 9.0. This does not affect the migration.
Oracle	Oracle Linux 6.0/6.1/6.2/6.3/6.4/6.5/6.6/6.7/6.8/6.9/6.10	64	No	-
	Oracle Linux 7.0	64	No	
	Oracle Linux 7.1/7.2/7.3/7.4/7.5/7.6/7.7/7.8/7.9	64	Yes	
	Oracle Linux 8.0/8.1/8.2/8.3/8.4/8.5	64	Yes	
SUSE	SUSE Linux Enterprise Server 11 SP3	64	No	-
	SUSE Linux Enterprise Server 11 SP4	64	Yes	
	SUSE Linux Enterprise Server 12 SP0	64	Yes	Btrfs file systems on this distribution cannot be migrated.
	SUSE Linux Enterprise Server 12 SP1/SP2/SP3/SP4/SP5	64	Yes	-
	SUSE Linux Enterprise Server 15 SP0/SP1/SP2/SP3	64	Yes	
	SUSE Linux Enterprise Server 15 SP4	64	No	

OS	Version	Bit	UEFI Support	Remarks
Ubuntu	Ubuntu Server 12.04	64	No	-
	Ubuntu Server 14.04	64	Yes	
	Ubuntu Server 16.04	64	Yes	
	Ubuntu Server 18.04	64	Yes	
	Ubuntu Server 19.04	64	Yes	
	Ubuntu Server 20.04	64	Yes	
	Ubuntu Server 22.04	64	Yes	
Debian	Debian GNU/Linux 6.0.10	64	No	-
	Debian GNU/Linux 7.11.0	64	No	
	Debian GNU/Linux 8.0/8.1/8.2/8.3/8.4/8.5/8.6/8.7/8.8/8.9/8.10/8.11	64	No	
	Debian GNU/Linux 9.0/9.1/9.2/9.3/9.4/9.5/9.6/9.7/9.8/9.9/9.10/9.11/9.12/9.13	64	No	
	Debian GNU/Linux 10.0/10.1/10.2/10.3/10.4/10.5/10.6/10.7/10.8/10.9/10.10/10.11/10.12/10.13	64	Yes	
	Debian GNU/Linux 11.0/11.1/11.2	64	Yes	
	Debian GNU/Linux 11.3/11.4/11.5/11.7	64	No	
Fedora	Fedora 23/24/25/26/27/28/29/33/34/35/36/37	64	No	-
EulerOS	EulerOS 2.2.0	64	No	-
	EulerOS 2.3.0	64	No	
	EulerOS 2.5.0	64	No	
Amazon Linux	Amazon Linux 2.0	64	No	-
	Amazon Linux 2018.3	64	No	
Alibaba Cloud Linux	Alibaba Cloud Linux 3.2104	64	No	-
	Alibaba Cloud Linux 3.2104 (Quick Start)	64	No	
	Alibaba Cloud Linux 2.1903 LTS	64	No	

OS	Version	Bit	UEFI Support	Remarks
	Alibaba Cloud Linux 2.1903 LTS (Quick Start)	64	No	
	Alibaba Cloud Linux 2.1903 LTS (CCSP 2.0 Level 3)	64	No	
Tencent OS	TencentOS Server 2.4	64	No	-
	TencentOS Server 2.4 (TK4)	64	No	
	TencentOS Server 3.1 (TK4)	64	No	
Kylin	Kylin Linux Advanced Server V10 (Sword)	64	No	-
OpenEuler	OpenEuler 20.03	64	No	-
	OpenEuler 21.09	64	No	
OpenSUSE	OpenSUSE 15.1/15.2/51.3/15.4	64	No	-
Rocky Linux	Rocky Linux 8.5/8.6/8.7/9.0/9.1	64	No	-

1.5.3 Disclaimer

- Source server data collection

  After the Agent is installed and configured on the source server, it automatically reports the source server information to SMS for verification. The collected information is used only for migration feasibility check. To use SMS, you need to allow SMS to collect source server information.

- License invalidity

  After OSs, applications, and files on source servers are migrated to target servers, the SIDs and MAC addresses of the servers will change. This means that some OS or application licenses may be invalidated. SMS is not responsible for this type of issue. You can use the license server on the cloud platform to obtain new licenses and update or obtain application licenses at your own expense.

- Target server disk formatting

  During a migration, disks on the target server are formatted and re-partitioned based on the source disk settings. Any existing data on the target server will be lost. Before the migration, make sure you have backed up any data on the target server that you need to save and ensure that the disks can be formatted. SMS is not responsible for any data losses incurred.

- If your target servers on the cloud platform cannot be started after the migration, the cloud platform can provide technical support to help you solve the problem, but does not promise that the all possible problems can be

resolved. There are many possible reasons that a target server may be unable to start, for example:

- The source server cannot be restarted.
- The source server has non-standard OS configurations.
- The source server has drivers or software that are incompatible with the cloud platform.

- SMS modifies the system configuration of a target server to make it compatible with the cloud service platform. SMS can ensure data consistency before and after the migration but cannot ensure that your services run properly after the migration. You need to modify related service configurations.

1.6 Service Agreement

This Service Agreement (hereinafter referred to as "this Agreement") describes your rights, obligations, and responsibilities during your use of Server Migration Service (SMS) (hereafter referred to as this Service). Please read the terms carefully, **especially the terms that have a significant impact on your rights and interests, such as exemption from liability and limitation of liability. Such terms are in bold in this Statement**.

You understand and agree that by using any service in this Agreement, you are deemed to have read and agree to the General Terms of Service in this Agreement and the Dedicated Terms of Service for the service you use. This Agreement shall become legally binding on you. If you do not agree to part or all of the terms of this Agreement, you shall stop using related services.

1. **General Terms of Service**

   1.1 Contracting Entity: This Agreement is entered into by and between **SMS (or "We") and you (o "User")**. Once this agreement takes effect, it has legal effect between you and us. You acknowledge that you are a natural person, legal person, or organization that has full capacity for civil conduct and may independently carry out civil juristic acts. If the foregoing is not true, please do not use this Service. Otherwise, you shall bear all consequences caused thereby. In the event that you register on behalf of a company or other legal entity or use this Service in a manner permitted by the cloud platform, you represent and warrant that you are an authorized representative of the company or legal entity to bind such company or legal entity to the terms of this Agreement.

   1.2 Separate Agreement: If you subscribe to this Service offline, purchase this Service through our partners, or purchase partner products that integrate this Service, you may sign a separate agreement with us or our partners. **You acknowledge and agree that you will remain bound by the separate agreement mentioned in this article if you are authorized to access and use this Service.** If this Agreement conflicts with the separate agreement, the separate agreement shall prevail.

   1.3 Agreement Update: This Agreement is subject to change. We will notify you of any changes to this Agreement by posting a notice on our website or by other means. You can also visit our website to read the latest service agreement. **If you do not agree to part or all of the latest Agreement,**

please stop using this Service. By continuing to use this Service, you acknowledge that you are aware of and agree to the latest Agreement.

1.4 Service Maintenance: We may maintain this Service from time to time through application upgrade, patch installation, or bug fixing. We will use our reasonable efforts to notify you of such maintenance events (except for emergency maintenance). You agree to use your best efforts to comply with any notified cooperation requirements.

1.5 You are committed to being responsible for your end users. If your end users violate laws and regulations when using services related to this Agreement, or improperly use the services and cause damages to any third parties, you will be liable for compensation.

1.6 Disclaimers

1.6.1 You understand and agree that we are not liable for unavailability of related services in the following situations:

a. Service unavailability or any legal consequences caused by your refusal to provide relevant information or the information provided not meeting service requirements
b. Service unavailability due to force majeure
c. Service unavailability due to your reasons or non-cloud platform reasons
d. Service unavailability during regular service maintenance

1.6.2 You understand and agree that before the lifecycle of a specific cloud service reaches the end of all service activities, we will make our best commercial efforts to notify you. You need to migrate or upgrade related workloads within a certain time window based on the notification. If you do not upgrade the cloud service to the new version, you agree that we have the right to automatically upgrade it when the right opportunity arises. We shall not be liable for any potential service outages arising from the upgrade.

2. **Dedicated Terms of Service**

2.1 **Service Content**

This Service helps you migrate servers from on-premises environments, private clouds, or public clouds to the cloud platform.

2.2 **Collection and Processing of Your Personal Data**

For the entire service process, you understand and agree that the cloud platform is entitled to collect, use, and process your personal data in accordance with the *Privacy Statement*.

2.3 **Processing Your Content Data**

You understand and agree that SMS is entrusted to collect and use your server information for the purposes of providing this Service. The information includes the host names, IP addresses, and MAC addresses of your servers. **SMS provides a controllable data deletion mechanism for you. The aforementioned information will be deleted when you confirm that your migration is complete and delete migration tasks on the console of this Service. Otherwise, deleting the information will cause migration failures.** You understand that the above information is necessary to provide services to you. If you choose not to provide or authorize us to collect and use of the above information, we will not be able to provide you with this Service.

You understand and agree that you and/or your end users entrust us to process your source server information and the data contained in the source

servers in any format when using SMS. You have full ownership and control over the data. **You are responsible for the legality of the source and acquisition of such data as well as the legality of migrating it from source servers to target servers, including but not limited to the compliance of cross-border data transfer. SMS is entrusted to process your data in order to migrate source server OSs and disk data to target servers on the cloud platform.**

2.4 Cooperation You Need to Provide

Creating agent images

Security standards iterate and security vulnerabilities develop over time. Before the migration, you need to create agent images and perform security scanning and hardening on the images. SMS provides standard agent images for you to test SMS availability. Do not use them to migrate your services.

Configuring security groups of target servers

SMS requires that traffic from source servers be allowed over specified ports on target servers. You need to configure security groups of target servers to allow only access from source servers and take other necessary measures to ensure migration security.

2.5 **Service Pricing**

SMS is free of charge, but you are billed at standard rates for the EVS disks, EVS disk snapshots, and data transfer generated during the migration process.

EVS disk

SMS creates and attaches a 40 GB EVS disk to each target server temporarily during the migration. These EVS disks are billed on a pay-per-use base. After the migrations are complete, these EVS disks will be released. Do not delete these EVS disks during the migration or change their billing modes to yearly/monthly, or the migrations will fail.

EVS disk snapshot

SMS creates snapshots for service cutover, data synchronization, and cloning target servers.

Data traffic

Traffic is generated during the migration and is billed as follows:

If the source public IP address is billed by bandwidth and you use the fixed bandwidth for migration over the Internet, the traffic you used will not be billed.

If the source public IP address is billed by traffic and you migrate data over the Internet, the price is calculated by multiplying the unit price of traffic by the amount of data migrated. For details about the unit price of traffic, contact the provider of the source public IP address. The amount of data migrated is the actual usage of disks on source servers.

If you use Direct Connect or Virtual Private Network (VPN) for migration, the cost depends on the price of your Direct Connect or VPN connections.

2.6 **Disclaimer**

License invalidity

After OSs, applications, and files on source servers are migrated to target servers, the SIDs and MAC addresses of the servers will change. This means that some OS or application licenses may become invalid. SMS is not

responsible for this type of issue. You can contact the image providers of your target servers to activate Windows OSs and update or obtain application licenses at your own expense.

Before a migration is complete, **do not perform operations on the OS or disks of the target server**, including but not limited to changing the OS and reinstalling the OS. SMS is not responsible for any fees or data damage incurred.

Target server disk formatting

During a migration, disks on the target server are formatted and re-partitioned based on the source disk settings. Any existing data on the target server will be lost. Before the migration, make sure you have backed up any data on the target server that you need to save and ensure that the disks can be formatted. SMS is not responsible for any data losses incurred.

Migration errors caused by source servers

SMS is not responsible for migration errors caused by source server problems, including but is not limited to damaged hardware (such as damaged disks or NICs), improper configurations, or software compatibility issues (such as incompatible OSs and applications), damaged data files, heavy service traffic, or slow network speeds. You can fix these problems by yourself, but if any such problems persist, you can contact us for assistance. We will make every effort to assist in resolving the problems but does not guarantee all possible problems can be resolved. The following problems with a source server may lead to migration errors:

A faulty source server OS. For example, a Windows startup file is damaged or missing.

An incorrectly configured source server OS. For example, GRUB or fstab is incorrectly configured on the source server.

Source server network problems. For example, the source server cannot access the Internet, the network is too slow, or the SSH connection or firewall is faulty.

Slow I/O on source server disks, too much incremental data, scattered effective clusters (on Windows), or too many small files (on Linux). These problems can slow down the migration or synchronization progress.

An incompatible source platform service or software

The Agent may be disabled by a source platform service or software, or the I/O monitoring could be disabled by antivirus software on the source server.

If your target servers on the cloud platform cannot be started after the migration, we can provide technical support to help you solve problems. We do not promise that the problems can be resolved.

To ensure compatibility with the cloud platform, SMS modifies the system configurations of target servers. SMS can ensure data consistency before and after the migration but cannot ensure that your services run properly after the migration. You need to modify related service configurations thereafter.

You are advised not to add data to target servers before the service cutover or to source servers after the service cutover. If new data is generated on both your source and target servers after the service cutover, SMS cannot combine data on the source and target servers. If you want to combine the new data on the source and target servers, you must design a solution by yourself.

2.7 **Other Special Notes**

Log printing

During a migration, SMS prints logs on the source and target servers. After the migration is complete, SMS automatically deletes the logs on the target server, and you need to manually delete the logs from the source server. The logs contain the IP addresses and disk, mounting, and fstab details. Logs on the source server will not be uploaded to SMS.

Configuration modification

To ensure that target servers can be started properly after the migration is complete, SMS modifies the boot, network, and system configurations of the servers.

Cross-border data transfer

SMS is only responsible for point-to-point data migration from source servers to target servers. It is unaware of the data migrated. If your server data needs to be migrated across borders, you must ensure the compliance of the migration.

Last updated on 22 November 2023

1.7 Billing

SMS is free of charge, but you are billed at standard rates for the EVS disks, EVS disk snapshots, and data transfer generated during the migration process.

- **EVS disk**

  SMS creates and attaches a 40 GB EVS disk to each target server temporarily during the migration. These EVS disks are billed on a pay-per-use base. After the migrations are complete, these EVS disks will be released.

  For example, if a high I/O EVS disk with the unit price of $0.0002 USD/GB-hour is used for 10 hours during migration, the fee of the EVS disk is $0.08 USD (0.0002 x 40 x 10).

- **Data traffic**

  Traffic is generated during the migration and is billed as follows:

  – If the source public IP address is billed by bandwidth and you use the fixed bandwidth for migration over the Internet, the traffic you used will not be billed.

  – If the source public IP address is billed by traffic and you migrate data over the Internet, the price is calculated by multiplying the unit price of traffic by the amount of data migrated. For details about the unit price of traffic, contact the provider of the source public IP address. The amount of data migrated is the actual usage of disks on source servers.

    If the public IP address is billed by traffic, the unit price is $0.15 USD/GB, and the total disk size of a source server is 500 GB with 300 GB used, the cost is $45 USD (0.15 x 300). Note that this fee is charged by the provider of the source public IP address.

  – If you use Direct Connect or Virtual Private Network (VPN) for migration, the cost depends on the price of your Direct Connect or VPN connections.

> **CAUTION**
>
> The preceding fees are for reference only. The actual fees may vary.

1.8 Permissions Management

You can use IMS for free to manage SMS permissions and grant your employees with different permissions, to ensure secure access to your resources.

With IAM, you can use your account to create IAM users for your employees, and grant permissions to the users to control their access to specific resources of various types.

> **NOTE**
>
> For example, you can create IAM users for software developers and assign specific permissions to allow them to use SMS but disallow them to delete the resources or perform any high-risk operations.

If your account does not need individual IAM users for permissions management, skip this section.

SMS Permissions

By default, new IAM users do not have any permissions assigned. To assign permissions to these new users, you need add them to one or more groups, and attach permission policies or roles to these groups. Users inherit permissions from the groups to which they are added and can perform specified operations on cloud services.

SMS is a global service deployed for all physical regions. SMS permissions are assigned to users in the Global project, and the users do not need to switch regions when accessing SMS.

Table 1-5 lists all the system-defined policies and roles of SMS. The cloud platform services interwork with each other, and some SMS roles are dependent on the roles of other services. When assigning SMS permissions to users, you need to also assign dependent roles for the SMS permissions to take effect.

Table 1-5 Common operations supported by each dependent system-defined policy or role

Operation	SMS FullAccess (Global)	OBS OperateAccess (OBS)	ECS FullAccess	VPC FullAccess
Creating migration tasks	√	x	√	√
Viewing migration progresses	√	x	x	x

IAM supports two types of policies: system-defined policies and custom policies.

- If an IAM user needs all SMS permissions, attach the preceding system-defined policies to the user group to which the user has been added.
- If an IAM user only needs some SMS permissions, you can create custom policies and attach these policies to the user group to which the user has been added.

For details, see **Creating a User and Assigning Permissions**.

NOTE

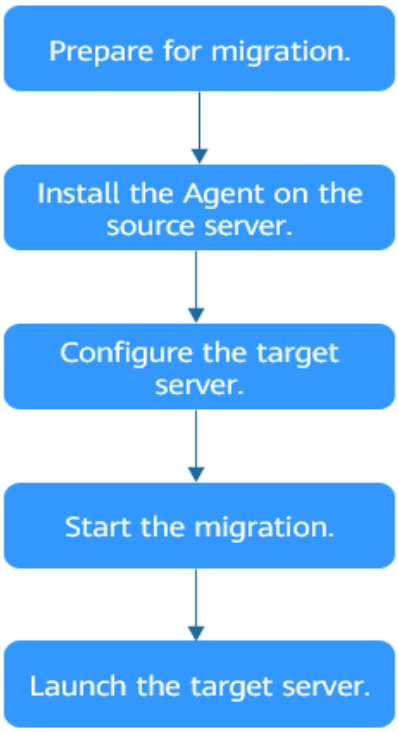
Compared with system-defined policies, custom policies provide more fine-grained and secure permissions control.

2 Getting Started

2.1 Quick Start

The following figure describes the basic process of using SMS.

Figure 2-1 Process of using SMS



2.2 Preparing for Migration

Before using SMS, make the following preparations:

1. Obtain an AK/SK pair for your target account.

If you use an IAM user for migration, contact the administrator for authorization and then create an AK/SK pair. For more information, see **How Do I Create an AK/SK Pair for an IAM User?**

2. Ensure that the source server OS is supported by SMS.

   See **Supported Windows OSs** and **Supported Linux OSs.**

3. Ensure that the following network requirements are met:

   a. The source server can connect to the cloud platform API Gateway over TCP port 443. For more information, see **Connecting Source Servers to the Cloud Platform API Gateway**.

   b. The source server can connect to the target server. For more information, see **Connecting Source Servers to Target Servers**.

      - To implement migration over the Internet, purchase and configure an EIP for the target server in advance.
      - To implement migration using Direct Connect or VPN, purchase and configure Direct Connect or VPN connections in advance.

   c. The required ports are enabled in any security group to which the target server belongs.

      - Windows: TCP ports 8899, 8900, and 22
      - Linux: TCP ports 8900 and 22

      For more information, see **How Do I Configure Security Group Rules for Target Servers?**

4. Ensure that the following source server requirements are met:

   Available Space

   – Windows: at least 320 MB of available space on a partition not smaller than 600 MB; at least 40 MB of available space on a partition smaller than 600 MB
   – Linux: at least 200 MB of available space on the root partition

   Source Environment

   – The system time of the source server must be consistent with the local standard time to prevent Agent registration failures.
   – For Linux servers, ensure that **rsync** is installed. You can run the **rsync -v** command to check whether **rsync** is installed.

     If it is not installed on the source server, install it as follows:

     - CentOS: **yum -y install rsync**
     - Ubuntu: **apt-get -y install rsync**
     - Debian: **apt-get -y install rsync**
     - SUSE: **zypper install rsync**
     - For other distributions, refer to the official website documentation.

       NOTE

       rsync usually comes pre-installed on most distributions by default.

  - For Windows servers, install one of the following Agents:
    - Windows Agent (Python 3): Windows Server 2019/2016/2012 and Windows 10/8.1
    - Windows Agent (Python 2): Windows Server 2008 and Windows 7

2.3 Installing the Agent on Source Servers

2.3.1 Windows

Scenarios

You need to install the Agent on each Windows source server that you want to migrate. During the Agent installation, you need to enter the AK/SK pair of your target account. After the Agent is started successfully, it automatically reports source server information to SMS. All collected data is used for migration only. For more information, see **What Information Does SMS Collect About Source Servers?**

There are two options for Windows:

- GUI-based Windows Agent (Python 3): Windows Server 2019/2016/2012 and Windows 10/8.1
- CLI-based Windows Agent (Python 2): Windows Server 2008 and Windows 7

⚠ CAUTION

You must log in to the Windows source server as user **Administrator**.

Prerequisites

- You have obtained the AK/SK pair of your target account
  - If you use an IAM user for migration, see **How Do I Create an AK/SK Pair for an IAM User?**
  - If you use an account for migration, see **How Do I Create an AK/SK Pair for an Account?**
- You have obtained the administrator permissions of the source server.
- You have confirmed that the source server OS is included in **Supported Windows OSs**.
- There is no antivirus software installed on the source server. Antivirus software may prevent the Agent from starting up.

  How Do I Fix the Error "Failed to start the I/O monitoring module" When I Start the Agent?

Downloading the Agent Installation File

Step 1 Log in to the management console.

Step 2 Click **Service List**. Under **Migration**, click **Server Migration Service**.

Step 3 In the navigation pane on the left, choose **Agents**.

Step 4 In the **Windows** area, click **Agent** to download the Agent you need. Please carefully read the precautions.

- Windows Agent (Python 3)

  This GUI-based version is designed for Windows Server 2019/2016/2012 and Windows 10/8.1.

- Windows Agent (Python 2)

  This CLI-based version is designed for Windows Server 2008 and Windows 7.

Step 5 Click **SHA256 File** in the pane of the Agent you have downloaded. Use the hash value contained in the downloaded file to verify the integrity of the Agent installation file. For details, see **How Do I Verify the Integrity of the Agent Installation File?**

----End

Installing Windows Agent (Python 3)

Step 1 Transmit the **SMS-Agent-Py3.exe** file to the source server.

Step 2 Log in to the source server as user **Administrator** and double-click the **SMS-Agent-Py3.exe** file.

Step 3 Click **Install** and wait for the installation to complete.

Step 4 Click **Finish**. The SMS-Agent GUI is displayed.

Step 5 Enter the AK/SK pair of the account and the SMS domain name in the region you are migrating to. You can obtain the SMS domain name on the **Agents** page of the SMS console.

Step 6 Click **Start**.

Step 7 Carefully review the **Privacy Statement** and click **Yes** if you want to continue.

When message **Upload success. Waiting for the SMS instruction** is displayed, the Agent has started up and started reporting source server information to SMS.

----End

Installing Windows Agent (Python 2)

Step 1 Upload the **SMS-Agent-Py2.exe** file to the source server.

Step 2 Log in to the source server as user **Administrator** and double-click the **SMS-Agent-Py2.exe** file.

Step 3 Click **Install** and wait for the installation to complete.

Step 4 Click **Finish**. The SMS-Agent CLI is displayed.

NOTE

To manually start the Agent when needed, double-click **agent-start.exe** in the installation directory **C:\SMS-Agent-Py2**.

Step 5 When prompted, enter the AK/SK pair of the cloud account and the SMS domain name in the region you are migrating to. You can obtain the SMS domain name on the **Agents** page of the SMS console.

After the authentication succeeds, the Agent starts to report source server information to SMS, and the window is closed.

----End

Troubleshooting

How Do I Resolve the Error "AK/SK authentication failed. Ensure that the system time is consistent with the standard time and the AK and SK are correct" When I Start the Agent?

2.3.2 Linux

Scenarios

You need to install the Agent on the source server. During the Agent installation, you need to enter the AK/SK pair of your account. After the Agent is started successfully, it automatically reports source server information to SMS. All collected data is used for migration only. For details, see **What Information Does SMS Collect About Source Servers?**

Prerequisites

- You have obtained the AK/SK pair of your cloud platform account
  - If you use an IAM user for migration, see **How Do I Create an AK/SK Pair for an IAM User?**
  - If you use an account for migration, see **How Do I Create an AK/SK Pair for an Account?**
- You have confirmed that the source server OS is included in **Supported Linux OSs**.

Installation

Step 1 Log in to the management console.

Step 2 Click **Service List**. Under **Migration**, click **Server Migration Service**.

Step 3 In the navigation pane on the left, choose **Agents**.

Step 4 Run any of the following commands to download the Agent installation file. You can also, in the **Linux** area of the **Agents** page, click to copy the command for downloading the installation file.

wget -t 3 -T 15 https://sms-agent-2-bucket.obs.ae-ad-1.g42cloud.com/SMS-Agent.tar.gz

curl -O https://sms-agent-2-bucket.obs.ae-ad-1.g42cloud.com/SMS-Agent.tar.gz

Step 5 Run the command following **SHA256 File**. Use the hash value contained in the SHA256 file to verify the integrity of the Agent installation package. For details, see **How Do I Verify the Integrity of the Agent Installation File?**

Step 6 On the source server, decompress the installation package.

tar -zxvf SMS-Agent.tar.gz

Step 7 Switch to the **SMS-Agent** directory on the source server.

cd SMS-Agent

Step 8 Start the Agent.

./startup.sh

Step 9 Carefully review the description of what information will be collected by the Agent, enter **y**, and press **Enter**.

Step 10 Enter the AK/SK pair of the account and the SMS domain name in the region you are migrating to. You can obtain the SMS domain name on the **Agents** page of the SMS console.

When the following information is displayed, the Agent has been started up and will automatically start reporting source server information to SMS.

```
Please input AK(Access Key ID) of the destination public cloud:
Please input SK(Secret Access Key) of the destination public cloud:**********
agent is starting...
sms agent start up successfully!
check the source server in Server Migration Service Console now!
You can use the agent-cli tool to monitor the sms agent
```

----End

Troubleshooting

- **How Do I Resolve the Error "No such file or directory: 'rsync':'rsync" When I Start the Linux Agent?**
- **How Do I Resolve the Error "AK/SK authentication failed. Ensure that the system time is consistent with the standard time and the AK and SK are correct" When I Start the Agent?**

2.4 (Optional) Creating a Migration Template

SMS allows you to create migration templates for quick configuration. When you configure the migration settings, you can use these templates to quickly configure parameters **Network**, **Migration Rate Limit**, **Continuous Synchronization Region**, and **Project**. For details, see **Creating a Migration Template**.

2.5 (Optional) Creating a Server Template

SMS allows you to create server templates for quick configuration. When you configure the target server, you can use these templates to quickly configure parameters such **VPC**, **Subnet**, and **Security Group**. For details, see **Creating a Server Template**.

2.6 Configuring a Target Server

Scenarios

After the Agent installed on a source server is started successfully, a migration record will be created for the source server on the SMS console. You need to configure a target server for receiving data migrated from the source server. You can clone the target server for service testing, and launch the target server after you verify that your services run properly on the target server.

Prerequisites

The migration is in the stage and **Ready** status.

Procedure

Step 1 Log in to the management console.

Step 2 Click **Service List**. Under **Migration**, click **Server Migration Service**.

Step 3 In the navigation pane on the left, click **Servers**.

Step 4 In the server list, locate the server to be migrated, and click **Configure** in the **Target** column.

After locating the server, you can also choose **More** > **Configure Target** in the **Operation** column.

Step 5 On the **Configure Basic Settings** page, configure parameters as prompted.

Table 2-1 Basic settings

Parameter	Sub-Parameter	Description
Migration Template	N/A	After you select a migration template, the system automatically sets **Network**, **Migration Rate Limit**, **Migration Method**, **Continuous Synchronization**, **Partition Resizing**, **Region**, and **Project** based on the template. The system automatically creates a default migration template for you. You can also create a migration template in advance. For details, see **Creating a Migration Template**.

Parameter	Sub-Parameter	Description
Network	Internet	An EIP must be bound to the target server. **Network** is set to **Internet** by default.
	Direct Connect/VPN	You need to create a Direct Connect or VPN connection between the source server and the VPC subnet where the target server is located in advance. If the source and target servers are in the same VPC, set **Network** to **Direct Connect/VPN**.
Migration Rate Limit	N/A	You can set the rate limits as needed based on the bandwidth size of the source server and service requirements. **0** indicates that the migration rate is not limited.
CPU Limit	-	These options are only available for Linux migrations. For details, see **How Do I Set Resource Limits for SMS-Agent During a Linux Server Migration?**
Memory Limit	-	
Disk Throughput Limit	-	
Migration Method	Linux block-level	Migration and synchronization are performed block by block. This method has high efficiency but poor compatibility.
	Linux file-level	Migration and synchronization are performed file by file. This method has low efficiency but excellent compatibility.
Migration Method	Windows block-level	Migration and synchronization are performed block by block. For Windows servers, SMS only supports block-level migration. This method has high efficiency.
Continuous Synchronization	No	After the full replication, SMS will automatically launch the target server without synchronizing incremental data. To synchronize incremental data, click **Sync** in the **Operation** column.

Parameter	Sub-Parameter	Description
	Yes	After the full replication, SMS will periodically synchronize incremental data. To complete the migration, you need to manually launch the target server.
Partition Resizing	No	The disk partitions on the target ECS are the same as those on the source server.
	Yes	You can resize the disk partitions on the target server. For details, see **Resizing disk partitions**.
Start Target Upon Launch	No	After the migration is complete, the target server will automatically shut down.
	Yes	After the migration is complete, the target server will automatically start.
Advanced Options	-	• Advanced options **Exclude Migration Paths**, **Include Sync Paths**, and **Exclude Sync Paths** are available for Linux file-level migrations. For details, see **In a Linux File-Level Migration, How Do I Exclude Directories from Migration and Synchronization?** • Advanced options **Data Compression** and **Compression Threads** are available for Linux file-level migrations. For details, see **How Do I Configure Data Compression for a Linux Block-Level Migration?** • For a Windows block-level migration over a private network, **Transit IP Address** is available.

- Resizing disk partitions

1. Click **Resize Partition** on the right of option **Yes**. In the displayed **Resize Partition** dialog box, resize the disk partitions on the target server as needed.

NOTE

- You can choose whether to migrate a source partition and resize the corresponding target partition.

  CAUTION

  - For the system and boot partitions on a Windows source server, **Migration** is fixed to **Yes** by default.
  - For Windows target servers, you can only expand a partition.
  - For the system and swap partitions on a Linux source server, **Migration** is fixed to **Yes** by default.
  - For Linux Btrfs file systems, **Migration** is fixed to **Yes** by default.
  - If you set **Migration** to **No** for all the logical volumes in the LVM, **Migration** will be set to **No** for the corresponding physical volumes automatically.
  - If you set **Migration** to **Yes** for at least one of the logical volumes in the LVM, **Migration** will also be set to **Yes** for the corresponding physical volumes automatically.
  - In Linux block-level migration, you can only increase a partition size.
  - In Linux file-level migration, you can increase or decrease a partition size. Ensure that the new partition size is at lease 1 GB larger than the used partition space. If the current partition size is smaller than the sum of the used partition space plus 1 GB, the disk partition size cannot be decreased.

- If the new partition size is larger than the disk size, click **Resize Disk** to expand the disk.
- If the new partition size is smaller than the disk size, click **Resize Disk** to shrink the disk.

2. Click **OK**.

CAUTION

After you click **OK**, the setting of **Partition Resizing** cannot be changed to **No**. If you want to restore the original disk partition settings, locate the row that contains the server to be migrated, click **More** in the **Operation** column, and select **Delete** from the drop-down list. Then, restart the Agent installed on the source server, configure the target server again, and set **Partition Resizing** to **No**.

Step 6 Click **Next: Configure Target** in the lower right corner.

Step 7 On the **Configure Target** page, set parameters as prompted.

Table 2-2 Parameters for configuring a target server

Parameter	Sub-Parameter	Description
Region	N/A	• Select a region where the target server is to be provisioned from the drop-down list. • Consider your service requirements.

Parameter	Sub-Parameter	Description
Project	N/A	• Select a project in the region from the drop-down list. • You can select a project only after selecting a region.
Server	Use existing	Select an existing server based on the recommended target server specifications above the server list. For details, see **Use existing**.
	Create during migration	Configure **VPC**, **Subnet**, **Security Group**, and parameters in **Advanced Settings**. For details, see **Create during migration**.

- Use existing

  A target server must meet requirements listed below. If no existing server meets the requirements, click **Buy Now** to create one that meets the requirements based on the recommended target server specifications.

  - A target server running Windows must have at least 2 GB of memory.
  - The target server must have at least as many disks as the source server, and the size of each disk on the target server must be at least as large as the recommended size.
  - The target server must run the same OS as the source server, or there will be a server name conflict.
  - The target server must have been configured with an EIP, VPN, or Direct Connect connection.
  - The security group of the target server must be correctly configured. It must be configured to allow access on the following ports:

    Windows: TCP ports 8899, 8900, and 22

    Linux: port 22 for a file-level migration and ports 8900 and 22 for a block-level migration

    For details, see **How Do I Configure the Security Group Rules for Target Servers?**

- Create during migration
  - If you select **Recommended** for **Server Template**, the VPC, subnet, and security group will be automatically created. You can change the configurations as needed.

The server name, AZ, specifications, system disk, data disk and EIP in advanced settings are automatically configured. You can modify the configurations as needed.

NOTE

- Supported device types for data disks are Virtual Block Device (VBD) and Small Computer System Interface (SCSI). VBD is the default data disk device type.
- Data disks can be created as shared disks.

– If you select an existing template, the VPC, subnet, security group, AZ, and disk will be configured based on the template. You can change the configurations as needed. For details, see **Creating a Server Template**.

NOTE

If you set **Server Template** to **Recommended**, SMS will automatically:

- Create a VPC and subnet.

  If the source IP address is 192.168.*X.X*, SMS creates a VPC and a subnet that both belong to network segment 192.168.0.0/16.

  If the source IP address is 172.16.*X.X*, SMS creates a VPC and a subnet that both belong to network segment 172.16.0.0/12.

  If the source IP address is 10.*X.X.X*, SMS creates a VPC and a subnet that both belong to network segment 10.0.0.0/8.

- Create a security group and enable ports based on the service requirements: ports 8899, 8900, and 22 for Windows migration, ports 8900 and 22 for Linux block-level migration, or port 22 for Linux file-level migration.

Step 8 Click **Next: Confirm** in the lower right corner.

Step 9 (Optional) Click **Save as Server Template**. In the displayed **Create Server Template** dialog box, enter the template name and click **OK** to save the target configuration as a template.

NOTE

Save as Server Template is available only when you set **Server Template** to **Recommended**.

Step 10 After you confirm that the configuration is correct, click **Save**. In the displayed dialog box, read the migration conditions and click **Yes**.

If you want to start the migration immediately, click **Save and Start**. In the displayed dialog box, read the migration conditions and click **Yes**.

NOTE

If is displayed in the **Migration Stage** column, the target server has been configured.

----End

2.7 Starting a Full Replication

Scenarios

A full replication replicates all data from the source server to the target server. The replication speed depends on the smaller one between the outbound bandwidth of the source server and the inbound bandwidth of the target server.

Constraints

After the full replication starts, do not restart the source server or Agent, or the migration will fail.

Prerequisites

- You have configured the target server. For details, see **Configuring a Target Server**.
- The **Migration Stage** is .

Procedure

Step 1 Log in to the management console.

Step 2 Click **Service List**. Under **Migration**, click **Server Migration Service**.

Step 3 In the navigation pane on the left, click **Servers**.

Step 4 Locate the source server to be migrated and click **Start** in the **Operation** column. In the displayed **Start Migration** dialog box, click **OK** to start the full replication.

Alternatively, select the server to be migrated and click **Start** above the server list. In the displayed **Start Migration** dialog box, click **OK** to start the full replication.

NOTE

During the full replication, the target server is locked by default and you are not allowed to perform any operations on it. After the migration is complete, the system automatically unlocks the target server. If you need to perform operations on the target server during the replication, unlock the target server first. For details, see **Unlocking a Target Server**.

Step 5 During the migration, you can click

to view the migration progress.

Step 6 Wait for the full replication to complete.

- If you set **Continuous Synchronization** to **No** when you configure the migration settings, the migration enters the **Target Launch** stage, and the system launches the target server automatically after the full replication is complete.
- If you set **Continuous Synchronization** to **Yes**, the migration enters the **Continuous sync** state after the full replication is complete. You need to

manually launch the target server. For details, see **Launching a Target Server**.

----End

2.8 Launching a Target Server

This section describes how to manually launch the target server after the full replication is complete if you set **Continuous Synchronization** to **Yes** when configuring the migration settings.

NOTE

If you set **Continuous Synchronization** to **No**, skip this section because the system will automatically launch the target server after the full replication is complete.

Scenarios

You can launch a target server for a migration in the **Continuous sync** status, and the continuous synchronization will be interrupted. If continuous synchronization is required after you launch the target server, click **Sync** to continuously synchronize incremental data.

Before launching the target server, you can clone the target server for service testing, and only launch the target server until tests confirm there are no issues.

NOTE

The cloned server must be in the same AZ as the target server, but can be in a different VPC.

Procedure

Step 1 Log in to the management console.

Step 2 Click **Service List**. Under **Migration**, click **Server Migration Service**.

Step 3 In the navigation pane on the left, click **Servers**.

Step 4 Locate the target server you want to launch, and click **Launch Target** in the **Operation** column.

Alternatively, select the server you want to launch, and click **Launch Target** above the server list.

Step 5 In the displayed **Launch Target** dialog box, click **OK**.

Step 6 Check whether the **Status** has changed to **Finished**. If it has, the target server has been launched and the migration is complete.

----End

2.9 Synchronizing Incremental Data

Scenarios

After the target server is launched, if there are data changes on your source server, you can synchronize the incremental data from the source server to the target server.

The data changes on the target server will be overwritten by the data synchronized from the source server. For details, see **Will an Incremental Synchronization Overwrite the Existing Data on a Launched Target Server?**

NOTE

Only tasks in the **Finished** status can be synchronized.

Procedure

Step 1 Log in to the management console.

Step 2 Click **Service List**. Under **Migration**, click **Server Migration Service**.

Step 3 In the navigation pane on the left, click **Servers**.

Step 4 In the server list, locate the source server you want to synchronize and click **Sync** in the **Operation** column.

Step 5 In the displayed **Synchronize Incremental Data** dialog box, check the synchronization description carefully and click **Yes**.

----End

3 User Guide

3.1 Permissions Management

3.1.1 Creating a User and Assigning Permissions

This section describes how to use IAM to implement fine-grained permissions control on your SMS resources. With IAM, you can:

- Create IAM users for employees based on the organizational structure of your enterprise. Each IAM user is assigned their own distinct security credentials for SMS.
- Assign only the minimum permissions required for users to perform a given task.
- Entrust a cloud platform account or cloud service to perform professional and efficient O&M on your SMS resources.

NOTE

A cloud platform account has all permissions required for using SMS by default. If you use your account to perform migration, skip this section.

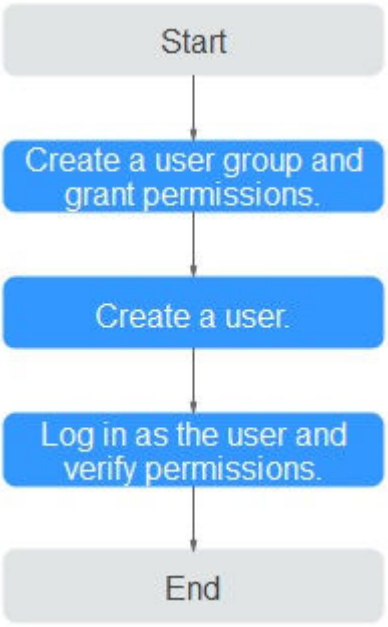
Figure 3-1 shows the process for assigning permissions.

Prerequisites

You must learn about the permissions (see **Permissions Management**) supported by SMS and choose policies or roles based on your service requirements. You can also use IAM to assign permissions of the other services.

Process Flow

Figure 3-1 Process for assigning SMS permissions



Procedure

Step 1 Create a user group and assign permissions to it.

- If the IAM users who will be added to this group need all SMS permissions, attach the system-defined policies supported by SMS, including **SMS FullAccess**, **OBS OperateAccess**, **ECS FullAccess**, and **VPC FullAccess**, to the group.
- If the IAM users only need specific SMS permissions, create custom policies and attach these policies to the user group. For details, see **SMS Custom Policies**.

  NOTE

  Compared with system-defined policies, custom policies provide more fine-grained and secure permissions control.

Step 2 Create an IAM user and add it to the user group.

Create a user on the IAM console and add the user to the group created in **Step 1**.

Step 3 Log in and verify permissions.

Log in to the management console as the created user, and verify the user's permissions for SMS.

- Choose **Service List** > **Server Migration Service**. In the navigation pane on the left, click **Servers**. In the server list, locate the server to be migrated, and click **Configure** in the **Target** column to configure the target server. If the target server can be configured, the permissions have taken effect.

- Choose any other service in the **Service List**. If a message appears indicating insufficient permissions to access the service, the permissions have taken effect.

----End

3.1.2 SMS Custom Policies

You can create custom policies using the visual editor, or with a JSON file.

- Visual editor: Select cloud services, actions, resources, and request conditions. This does not require knowledge of policy syntax.
- JSON: Edit JSON policies from scratch or based on an existing policy.

The section provides a typical SMS custom policy example.

Example SMS Custom Policy

```
{
   "Version": "1.1",
   "Statement": [
      {
         "Action": [
            "vpc:securityGroups:create",
            "vpc:securityGroupRules:create",
            "vpc:vpcs:create",
            "vpc:publicIps:create",
            "vpc:subnets:create",
            "ecs:cloudServers:create",
            "ecs:cloudServers:attach",
            "ecs:cloudServers:detachVolume",
            "ecs:cloudServers:start",
            "ecs:cloudServers:stop",
            "ecs:cloudServers:delete",
            "ecs:cloudServers:reboot",
            "ecs:cloudServers:updateMetadata",
            "ecs:serverPasswords:manage",
            "ecs:serverKeypairs:delete",
            "ecs:diskConfigs:use",
            "ecs:CloudServers:create",
            "ecs:servers:setMetadata",
            "ecs:serverVolumes:use",
            "ecs:serverKeypairs:create",
            "ecs:serverInterfaces:use",
            "ecs:serverGroups:manage",
            "ecs:securityGroups:use",
            "ecs:servers:unlock",
            "ecs:servers:rebuild",
            "ecs:servers:lock",
            "ecs:servers:reboot",
            "evs:volumes:use",
            "evs:volumes:create",
            "evs:volumes:update",
            "evs:volumes:delete",
            "evs:volumes:attach",
            "evs:volumes:detach",
            "evs:snapshots:create",
            "evs:snapshots:delete",
            "evs:snapshots:rollback",
            "ecs:*:get*",
            "ecs:*:list*",
            "evs:*:get*",
            "evs:*:list*",
            "vpc:*:list*",
            "vpc:*:get*",
            "ims:*:get*",
```

```
            "ims:*:list*"
        ],
        "Effect": "Allow"
    }
  ]
}
```

For details about policies supported by SMS, see **Table 3-1**.

Table 3-1 Policy description

Policy	Permission Description
sms:server:queryServer	Read-only permission for viewing source servers
sms:server:registerServer	Read/write permission for registering source servers
sms:server:migrationServer	Read/write permission for migrating source servers

3.2 Server Management

3.2.1 Configuring a Target Server

Scenarios

After the Agent installed on a source server is started successfully, a migration record will be created for the source server on the SMS console. You need to configure a target server for receiving data migrated from the source server. You can clone the target server for service testing, and launch the target server after you verify that your services run properly on the target server.

Prerequisites

The migration is in the stage and **Ready** status.

Procedure

Step 1 Log in to the management console.

Step 2 Click **Service List**. Under **Migration**, click **Server Migration Service**.

Step 3 In the navigation pane on the left, click **Servers**.

Step 4 In the server list, locate the server to be migrated, and click **Configure** in the **Target** column.

After locating the server, you can also choose **More** > **Configure Target** in the **Operation** column.

Step 5 On the **Configure Basic Settings** page, configure parameters as prompted.

Table 3-2 Basic settings

Parameter	Sub-Parameter	Description
Migration Template	N/A	After you select a migration template, the system automatically sets **Network**, **Migration Rate Limit**, **Migration Method**, **Continuous Synchronization**, **Partition Resizing**, **Region**, and **Project** based on the template. The system automatically creates a default migration template for you. You can also create a migration template in advance. For details, see **Creating a Migration Template**.
Network	Internet	An EIP must be bound to the target server. **Network** is set to **Internet** by default.
	Direct Connect/VPN	You need to create a Direct Connect or VPN connection between the source server and the VPC subnet where the target server is located in advance. If the source and target servers are in the same VPC, set **Network** to **Direct Connect/VPN**.
Migration Rate Limit	N/A	You can set the rate limits as needed based on the bandwidth size of the source server and service requirements. **0** indicates that the migration rate is not limited.
CPU Limit	-	These options are only available for Linux migrations. For details, see **How Do I Set Resource Limits for SMS-Agent During a Linux Server Migration?**
Memory Limit	-	
Disk Throughput Limit	-	
Migration Method	Linux block-level	Migration and synchronization are performed block by block. This method has high efficiency but poor compatibility.

Parameter	Sub-Parameter	Description
	Linux file-level	Migration and synchronization are performed file by file. This method has low efficiency but excellent compatibility.
Migration Method	Windows block-level	Migration and synchronization are performed block by block. For Windows servers, SMS only supports block-level migration. This method has high efficiency.
Continuous Synchronization	No	After the full replication, SMS will automatically launch the target server without synchronizing incremental data. To synchronize incremental data, click **Sync** in the **Operation** column.
	Yes	After the full replication, SMS will periodically synchronize incremental data. To complete the migration, you need to manually launch the target server.
Partition Resizing	No	The disk partitions on the target ECS are the same as those on the source server.
	Yes	You can resize the disk partitions on the target server. For details, see **Resizing disk partitions**.
Start Target Upon Launch	No	After the migration is complete, the target server will automatically shut down.
	Yes	After the migration is complete, the target server will automatically start.

Parameter	Sub-Parameter	Description
Advanced Options	-	• Advanced options **Exclude Migration Paths**, **Include Sync Paths**, and **Exclude Sync Paths** are available for Linux file-level migrations. For details, see **In a Linux File-Level Migration, How Do I Exclude Directories from Migration and Synchronization?** • Advanced options **Data Compression** and **Compression Threads** are available for Linux file-level migrations. For details, see **How Do I Configure Data Compression for a Linux Block-Level Migration?** • For a Windows block-level migration over a private network, **Transit IP Address** is available.

- Resizing disk partitions

1. Click **Resize Partition** on the right of option **Yes**. In the displayed **Resize Partition** dialog box, resize the disk partitions on the target server as needed.

NOTE

- You can choose whether to migrate a source partition and resize the corresponding target partition.

  CAUTION

  - For the system and boot partitions on a Windows source server, **Migration** is fixed to **Yes** by default.
  - For Windows target servers, you can only expand a partition.
  - For the system and swap partitions on a Linux source server, **Migration** is fixed to **Yes** by default.
  - For Linux Btrfs file systems, **Migration** is fixed to **Yes** by default.
  - If you set **Migration** to **No** for all the logical volumes in the LVM, **Migration** will be set to **No** for the corresponding physical volumes automatically.
  - If you set **Migration** to **Yes** for at least one of the logical volumes in the LVM, **Migration** will also be set to **Yes** for the corresponding physical volumes automatically.
  - In Linux block-level migration, you can only increase a partition size.
  - In Linux file-level migration, you can increase or decrease a partition size. Ensure that the new partition size is at lease 1 GB larger than the used partition space. If the current partition size is smaller than the sum of the used partition space plus 1 GB, the disk partition size cannot be decreased.

- If the new partition size is larger than the disk size, click **Resize Disk** to expand the disk.
- If the new partition size is smaller than the disk size, click **Resize Disk** to shrink the disk.

2. Click **OK**.

CAUTION

After you click **OK**, the setting of **Partition Resizing** cannot be changed to **No**. If you want to restore the original disk partition settings, locate the row that contains the server to be migrated, click **More** in the **Operation** column, and select **Delete** from the drop-down list. Then, restart the Agent installed on the source server, configure the target server again, and set **Partition Resizing** to **No**.

Step 6 Click **Next: Configure Target** in the lower right corner.

Step 7 On the **Configure Target** page, set parameters as prompted.

Table 3-3 Parameters for configuring a target server

Parameter	Sub-Parameter	Description
Region	N/A	• Select a region where the target server is to be provisioned from the drop-down list. • Consider your service requirements.

Parameter	Sub-Parameter	Description
Project	N/A	• Select a project in the region from the drop-down list. • You can select a project only after selecting a region.
Server	Use existing	Select an existing server based on the recommended target server specifications above the server list. For details, see **Use existing**.
	Create during migration	Configure **VPC**, **Subnet**, **Security Group**, and parameters in **Advanced Settings**. For details, see **Create during migration**.

- Use existing

  A target server must meet requirements listed below. If no existing server meets the requirements, click **Buy Now** to create one that meets the requirements based on the recommended target server specifications.

  - A target server running Windows must have at least 2 GB of memory.
  - The target server must have at least as many disks as the source server, and the size of each disk on the target server must be at least as large as the recommended size.
  - The target server must run the same OS as the source server, or there will be a server name conflict.
  - The target server must have been configured with an EIP, VPN, or Direct Connect connection.
  - The security group of the target server must be correctly configured. It must be configured to allow access on the following ports:

    Windows: TCP ports 8899, 8900, and 22

    Linux: port 22 for a file-level migration and ports 8900 and 22 for a block-level migration

    For details, see **How Do I Configure the Security Group Rules for Target Servers?**
- Create during migration
  - If you select **Recommended** for **Server Template**, the VPC, subnet, and security group will be automatically created. You can change the configurations as needed.

The server name, AZ, specifications, system disk, data disk and EIP in advanced settings are automatically configured. You can modify the configurations as needed.

NOTE

- Supported device types for data disks are Virtual Block Device (VBD) and Small Computer System Interface (SCSI). VBD is the default data disk device type.
- Data disks can be created as shared disks.

– If you select an existing template, the VPC, subnet, security group, AZ, and disk will be configured based on the template. You can change the configurations as needed. For details, see **Creating a Server Template**.

NOTE

If you set **Server Template** to **Recommended**, SMS will automatically:

- Create a VPC and subnet.

  If the source IP address is 192.168.*X.X*, SMS creates a VPC and a subnet that both belong to network segment 192.168.0.0/16.

  If the source IP address is 172.16.*X.X*, SMS creates a VPC and a subnet that both belong to network segment 172.16.0.0/12.

  If the source IP address is 10.*X.X.X*, SMS creates a VPC and a subnet that both belong to network segment 10.0.0.0/8.

- Create a security group and enable ports based on the service requirements: ports 8899, 8900, and 22 for Windows migration, ports 8900 and 22 for Linux block-level migration, or port 22 for Linux file-level migration.

Step 8 Click **Next: Confirm** in the lower right corner.

Step 9 (Optional) Click **Save as Server Template**. In the displayed **Create Server Template** dialog box, enter the template name and click **OK** to save the target configuration as a template.

NOTE

Save as Server Template is available only when you set **Server Template** to **Recommended**.

Step 10 After you confirm that the configuration is correct, click **Save**. In the displayed dialog box, read the migration conditions and click **Yes**.

If you want to start the migration immediately, click **Save and Start**. In the displayed dialog box, read the migration conditions and click **Yes**.

NOTE

If is displayed in the **Migration Stage** column, the target server has been configured.

----End

3.2.2 Starting a Full Replication

Scenarios

A full replication replicates all data from the source server to the target server. The replication speed depends on the outbound bandwidth of the source server and the inbound bandwidth of the destination server, whichever is smaller.

Constraints

After the full replication starts, do not restart the source server or Agent, or the migration will fail.

Prerequisites

- You have configured the target server. For details, see **Configuring a Target Server**.
- The **Migration Stage** is .

Procedure

Step 1 Log in to the management console.

Step 2 Click **Service List**. Under **Migration**, click **Server Migration Service**.

Step 3 In the navigation pane on the left, click **Servers**.

Step 4 Locate the source server to be migrated and click **Start** in the **Operation** column. In the displayed **Start Migration** dialog box, click **OK** to start the full replication.

Alternatively, select the server to be migrated and click **Start** above the server list. In the displayed **Start Migration** dialog box, click **OK** to start the full replication.

NOTE

During the full replication, the target server is locked by default and you are not allowed to perform any operations on it. After the migration is complete, the system automatically unlocks the target server. If you need to perform operations on the target server during the replication, unlock the target server first. For details, see **Unlocking a Target Server**.

Step 5 During the migration, you can click

to view the migration progress.

Step 6 Wait for the full replication to complete.

- If you set **Continuous Synchronization** to **No** when you configure the migration settings, the migration enters the **Target Launch** stage after the full replication is complete, and the system launches the target server.
- If you set **Continuous Synchronization** to **Yes**, the migration enters the **Continuous sync** stage after the full replication is complete, and the system synchronizes incremental source data to the target server. You need to manually launch the target server. For details, see **Launching a Target Server**.

----End

3.2.3 (Optional) Cloning a Target Server

Scenarios

Before launching the target server, you can clone the target server for service testing, and only launch the target server until tests confirm there are no issues.

NOTE

The cloned server must be in the same AZ as the target server, but can be in a different VPC.

Prerequisites

The migration is in the stage and **Continuous sync** status.

Procedure

Step 1 Log in to the management console.

Step 2 Click **Service List**. Under **Migration**, click **Server Migration Service**.

Step 3 In the navigation pane on the left, click **Servers**.

Step 4 Locate the target server you want to clone, click **More** in the **Operation** column, and select **Clone Target**.

Step 5 Set the parameters and click **Clone Target**.

- If you set **Recommended** for **Server Template**, the system automatically sets **VPC**, **Subnet**, **Security Group**, and parameters in **Advanced Settings** based on the current target server configuration. You can also manually modify these parameters.
- If you select an existing template for **Server Template**, parameters **VPC**, **Subnet**, **Security Group**, and those in **Advanced Settings** are set based on the template. You can also manually modify these parameters.

Step 6 Check whether the name of the cloned server is displayed in the server details. If it is, the cloning is complete.

----End

3.2.4 Launching a Target Server

This section describes how to manually launch the target server after the full replication is complete if you set **Continuous Synchronization** to **Yes** when configuring the migration settings.

NOTE

If you set **Continuous Synchronization** to **No**, skip this section because the system will automatically launch the target server after the full replication is complete.

Scenarios

You can launch a target server for a migration in the **Continuous sync** status, and the continuous synchronization will be interrupted. If continuous synchronization

is required after you launch the target server, click **Sync** to continuously synchronize incremental data.

Before launching the target server, you can clone the target server for service testing, and only launch the target server until tests confirm there are no issues.

NOTE

The cloned server must be in the same AZ as the target server, but can be in a different VPC.

Procedure

Step 1 Log in to the management console.

Step 2 Click **Service List**. Under **Migration**, click **Server Migration Service**.

Step 3 In the navigation pane on the left, click **Servers**.

Step 4 Locate the target server you want to launch, and click **Launch Target** in the **Operation** column.

Alternatively, select the server you want to launch, and click **Launch Target** above the server list.

Step 5 In the displayed **Launch Target** dialog box, click **OK**.

Step 6 Check whether the **Status** has changed to **Finished**. If it has, the target server has been launched and the migration is complete.

----End

3.2.5 Viewing a Server Details

Scenarios

After the Agent is installed and started, it automatically reports the source server information to SMS. All collected data is used for migration only. For details, see **What Information Does SMS Collect About Source Servers?** You can log in to the SMS console to view server information at any time. You can review source server details, target server configurations, migration status, and error messages.

Procedure

Step 1 Log in to the management console.

Step 2 Click **Service List**. Under **Migration**, click **Server Migration Service**.

Step 3 In the navigation pane on the left, click **Servers**.

Step 4 Click the name of the server you want to view.

Step 5 On the **Basic Information** tab page, view the source server details, migration settings, target server details, and latest task progress. On the **Task Tracing** tab page, view the migration tasks and progresses.

----End

3.2.6 Synchronizing Incremental Data

Scenarios

After the target server is launched, if there are data changes on your source server, you can synchronize the incremental data from the source server to the target server.

NOTE

Only tasks in the **Finished** status can be synchronized.

Procedure

Step 1 Log in to the management console.

Step 2 Click **Service List**. Under **Migration**, click **Server Migration Service**.

Step 3 In the navigation pane on the left, click **Servers**.

Step 4 In the server list, locate the source server you want to synchronize and click **Sync** in the **Operation** column.

Step 5 In the displayed **Synchronize Incremental Data** dialog box, check the synchronization description carefully and click **Yes**.

----End

3.2.7 Deleting the Target Server Configuration

Scenarios

If a target server is incorrectly configured or its configurations need to be modified, you can delete the target server configuration and reconfigure the target server.

CAUTION

Migration tasks will be deleted together with the target configurations. All source data needs to be migrated again.

Procedure

Step 1 Log in to the management console.

Step 2 Click **Service List**. Under **Migration**, click **Server Migration Service**.

Step 3 In the navigation pane on the left, click **Servers**.

Step 4 Locate the server for which you want to delete the target server configuration, and choose **More** > **Delete Target Configuration** in the **Operation** column.

You can also select the server for which you want to delete the target server configuration, and choose **More** > **Delete Target Configuration** in the upper left corner of the server list.

Step 5 In the displayed **Delete Target Configuration** dialog box, click **OK**.

----End

3.2.8 (Optional) Deleting a Cloned Server

Scenarios

You can delete a cloned server when it is no longer needed or the service test succeeds.

NOTE

You can switch to the ECS console to check whether the deletion is successful.

Procedure

Step 1 Log in to the management console.

Step 2 Click **Service List**. Under **Migration**, click **Server Migration Service**.

Step 3 In the navigation pane on the left, click **Servers**.

Step 4 Locate the server for which you want to delete the cloned server, and choose **More** > **Delete Clone** in the **Operation** column.

Step 5 In the **Delete Clone** dialog box, click **OK**.

----End

3.2.9 Deleting a Server

Scenarios

Deleting a server means deleting a server record from SMS. You can delete a server record as needed.

CAUTION

- After deleting a server record, restart the Agent on the source server if you want to register the server again with SMS.
- Deleting a server record will not delete the corresponding source or target server.

Procedure

Step 1 Log in to the management console.

Step 2 Click **Service List**. Under **Migration**, click **Server Migration Service**.

Step 3 In the navigation pane on the left, choose **Servers**.

Step 4 Locate the server record you want to delete, and choose **More** > **Delete** in the **Operation** column.

Alternatively, select the target source server and choose **More** > **Delete** in the upper left corner of the server list.

Step 5 In the displayed **Delete Server** dialog box, click **OK**.

----End

3.2.10 Setting the Migration Rate

Scenarios

During the migration, a large amount of traffic is generated and bandwidth consumed. To reduce the impact of the migration on services, you can limit the migration rate.

Procedure

Step 1 Log in to the management console.

Step 2 Click **Service List**. Under **Migration**, click **Server Migration Service**.

Step 3 In the navigation pane on the left, choose **Servers**.

Step 4 Locate the server for which you want to set the migration rate, and choose **More** > **Set Migration Rate** in the **Operation** column.

NOTE

The value of **Migration Rate** must be an integer from **0** to **1000**.

- You can enter **0** or leave this field blank to remove migration speed limits. In this case, the migration rate is the network rate between the source and target servers.
- If the migration rate you configure is greater than the network rate available between the two servers, then the actual migration rate will depend on the speed of the network connection.

Step 5 In the displayed **Set Migration Rate** dialog box, set migration rate limits and click **OK**.

----End

3.2.11 Unlocking a Target Server

Scenarios

During the full replication, the target server is locked by default and you are not allowed to perform any operations on it. After the migration is complete, the system automatically unlocks the target server. If you need to perform operations on the target server during the migration, unlock the target server first.

Procedure

Step 1 Log in to the management console.

Step 2 Click **Service List**. Under **Migration**, click **Server Migration Service**.

Step 3 In the navigation pane on the left, choose **Servers**.

Step 4 Locate the server for which you want to unlock the target server, and choose **More** > **Unlock Target** in the **Operation** column.

Step 5 In the displayed **Unlock Target** dialog box, click **OK**.

----End

3.3 Template Management

3.3.1 Creating a Migration Template

Scenarios

SMS allows you to create migration templates for quick configuration. You can use these templates to quickly configure the migration settings, such as parameters **Network**, **Migration Rate Limit**, **Continuous Synchronization**, **Region**, and **Project**.

Procedure

Step 1 Log in to the management console.

Step 2 Click **Service List**. Under **Migration**, click **Server Migration Service**.

Step 3 In the navigation pane on the left, choose **Configurations** to switch to the desired page.

Step 4 In the upper right corner of the **Migration Templates** area, click **Create Migration Template**. In the displayed **Create Migration Template** dialog box, enter a name and description, and click **OK**.

NOTE

The template name cannot be changed after the template is created.

Step 5 In the left part of the **Migration Templates** area, click the name of the created template.

In the right part of the **Migration Templates** area, click next to **Parameter Settings** to configure template parameters.

Table 3-4 describes the parameters.

Table 3-4 Parameters

Parameter	Sub-Parameter	Description
Region	N/A	Select a region based on service requirements.
Project	N/A	You can select a project only after a region is selected.
Linux Migration	Linux block-level	Migration and synchronization are performed block by block. This method has high efficiency but poor compatibility.
	Linux file-level	Migration and synchronization are performed file by file. This method has low efficiency but excellent compatibility.
Windows Migration	Windows block-level	Migration and synchronization are performed block by block. For Windows servers, SMS only supports block-level migration. This method has high efficiency.
Network	Internet	An EIP must be bound to the target server. **Network** is set to **Internet** by default.
	Direct Connect/VPN	You need to create a Direct Connect or VPN connection between the source server and the VPC subnet where the target server is located in advance. If the source and target servers are in the same VPC, set **Network** to **Direct Connect/VPN**.

Parameter	Sub-Parameter	Description
Migration Rate Limit	N/A	You can set the rate limits as needed based on the bandwidth size of the source server and service requirements. If this parameter is set to **0**, the migration rate is not limited.
Continuous Synchronization	No	After the full replication, SMS will not perform a continuous synchronization and launch the target server automatically. To synchronize incremental data, click **Sync** in the **Operation** column.
	Yes	After the full replication, SMS will periodically synchronize incremental data. To complete the migration, you need to manually launch the target server.
Server	Use existing	You need to select an existing server based on the recommended target server specifications when you configure the target server.
	Create during migration	You need to set parameters such as the VPC, subnet, and security group as required when you configure the target server.

Step 6 Click **OK**.

Step 7 (Optional) Click the name of the created template, and click **Set as Default Template** to set it as the default template.

----End

3.3.2 Modifying a Migration Template

Scenarios

You can modify a migration template that does not meet your requirements.

Procedure

Step 1 Log in to the management console.

Step 2 Click **Service List**. Under **Migration**, click **Server Migration Service**.

Step 3 In the navigation pane on the left, choose **Configurations** to switch to the desired page.

Step 4 In the left part of the **Migration Templates** area, click the name of the template you want to modify.

In the right part of the **Migration Templates** area, click next to **Basic Information** and **Parameter Settings** to modify the template description and parameters.

Step 5 Click **OK**.

----End

3.3.3 Deleting a Migration Template

Scenarios

You can delete a migration template that is no longer needed.

Procedure

Step 1 Log in to the management console.

Step 2 Click **Service List**. Under **Migration**, click **Server Migration Service**.

Step 3 In the navigation pane on the left, choose **Configurations** to switch to the desired page.

Step 4 In the left part of the **Migration Templates** area, click next to the name of the template you want to delete.

Step 5 In the displayed dialog box, click **OK**.

----End

3.3.4 Creating a Server Template

Scenarios

SMS allows you to create server templates for quick configuration. You can use these templates to quickly configure target server settings, such as **VPC**, **Subnet**, and **Security Group**.

Procedure

Step 1 Log in to the management console.

Step 2 Click **Service List**. Under **Migration**, click **Server Migration Service**.

Step 3 In the navigation pane on the left, choose **Configurations** to switch to the desired page.

Step 4 In the upper right corner of the **Server Templates** area, click **Create Server Template**.

Step 5 Enter a template name, click next to **Configuration**, and set parameters listed in **Table 3-5**.

Table 3-5 Parameters

Parameter	Description
Region	• Select a region where the target server resides from the drop-down list. • By default, the region is the one set in the default migration template, but you can select another region you want to use.
Project	• Select a project in the region from the drop-down list. • You can select a project only after a region is selected.
VPC	If you select **Create during migration**, SMS will recommend a VPC when you use this template to configure the target server. • If the source IP address is 192.168.*X.X*, SMS will recommend a VPC and a subnet that both belong to network segment 192.168.0.0/16. • If the source IP address is 172.16.*X.X*, SMS will recommend a VPC and a subnet that both belong to network segment 172.16.0.0/12. • If the source IP address is 10.*X.X*, SMS will recommend a VPC and a subnet that both belong to network segment 10.0.0.0/8.

Parameter	Description
Subnet	• If you select **Create during migration**, SMS will recommend a subnet when you use this template to configure the target server. • The subnet is in the same network segment as the VPC.
Security Group	If you select **Create during migration**, SMS will recommend a security group and allow traffic on required ports when you use this template to configure the target server. • Windows: ports 8899, 8900, and 22 • Linux: port 22 for file-level migration and ports 8900 and 22 for block-level migration
AZ	The parameter is set to **Random** by default. You can also select another AZ.
Data Disk	The value can be **Common I/O**, **High I/O**, or **Ultra-high I/O**.

Step 6 Click **OK**.

----End

Related Operations

You can perform the following operations on a created server template.

Operation	Description
Modifying a server template	1. Locate the server template you want to modify and click **Modify** in the **Operation** column. 2. In the displayed **Modify** dialog box, modify the parameters and click **OK**.
Deleting a server template	1. Locate the server template you want to delete and click **Delete** in the **Operation** column. 2. In the displayed **Delete** dialog box, click **OK**.

3.4 Viewing CTS Traces

3.4.1 SMS Operations Supported by CTS

Table 3-6 Key SMS operations recorded by CTS

Operation	Resource Type	Event Name
Adding a source	sourceServer	addSource
Deleting a source	sourceServer	removeSource
Updating a source name	sourceServer	updateSourceName
Creating a task	addTask	addTask
Deleting a task	deleteTask	deleteTask
Starting a task	updateTask	task-start
Stopping a task	updateTask	task-stop
Synchronizing a task	updateTask	task-sync
Updating the task progress	updateTaskProgress	updateTaskProgress
Saving a template	addTemplate	addTemplate
Modifying a template	updateTemplate	update
Deleting a template	deleteTemplate	deleteTemplate
Deleting templates in batches	deleteTemplates	deleteTemplates
Response results of operations	TaskCommand	processCommandResult

3.4.2 Viewing Tracing Logs

Scenarios

CTS starts to record SMS operations immediately after it is provisioned. You can view the operation records of the last seven days on the CTS console.

Procedure

1. Log in to the management console.
2. Click **Service List** and choose **Management & Deployment** > **Cloud Trace Service**.

3. In the navigation pane on the left, choose **Trace List**
4. In the upper right corner of the trace list, click **Filter** to set the search criteria. The following four filter criteria are available:
   - **Trace Type**, **Trace Source**, **Resource Type**, and **Search By**: Select a filter from the drop-down list.

     When you select **Resource ID** for **Search By**, you also need to select or enter a resource ID.
   - **Operator**: Select a specific operator from the drop-down list.
   - **Trace Status**: Available options include **All trace statuses**, **Normal**, **Warning**, and **Incident**.
   - Time range: In the upper right corner of the page, you can query traces in the last one hour, last one day, last one week, or within a customized period.
5. Click **Query**.
6. On the right of the filter box, click **Export**. CTS exports a CSV file listing query results.
7. Click on the left of the required trace to expand its details.
8. Click **View Trace** in the **Operation** column. A dialog box is displayed, showing the trace structure details.

3.5 Creating Custom Agent Images

3.5.1 Using Custom Agent Images

If you use a self-made agent image during migration, you need to create a private image using the agent image and modify the configuration file. For details, see **Creating a Windows Agent Image** and **Creating a Linux Agent Image**.

Precautions

SMS only provides standard, security-hardened agent images for testing use. You need to use your custom agent images for migration.

- You are advised to use your custom agent images for migration of sensitive data. Before the migration, you need to scan and evaluate security risks in your agent images. SMS technical support can provide help for you. You are responsible for possible migration failures and data losses caused by the security risks identified in your agent images.
- The agent images provided by SMS are only for migration testing. You are not advised to use them for other purposes.
- In your custom agent images created using SMS agent images, do not change the IP address 169.254.*XX.XX* contained in the scripts. The IP address is used by ECS to access the metadata service.

Using a Windows Agent Image (Python 3)

Step 1 Log in to the SMS console. In the navigation pane on the left, choose **Agents**.

Step 2 Download Windows Agent (Python 3), upload it to the source server, and double-click **SMS-Agent-Py3.exe** to install the SMS-Agent. Click **Finish** to complete the installation.

Step 3 Enter the AK/SK pair and SMS domain name to start the SMS-Agent.

Step 4 Go to the directory where the SMS-Agent was installed (typically **C:\SMS-Agent-Py3\config**).

Step 5 In the **cloud-region.json** file, search for **"windows_ssh_image_id"** and replace the content as indicated by the arrow in the picture below with the ID of your custom image.

----End

Using a Windows Agent Image (Python 2)

Step 1 Log in to the SMS console. In the navigation pane on the left, choose **Agents**.

Step 2 Download Windows Agent (Python 2), upload it to the source server, and double-click **SMS-Agent-Py2.exe** to install the SMS-Agent. Click **Finish** to complete the installation.

Step 3 Enter the AK/SK pair and SMS domain name to start the SMS-Agent.

Step 4 Go to the directory where the SMS-Agent was installed (typically **C:\SMS-Agent-Py2\config**).

Step 5 In the **cloud-region.json** file, search for **"windows_ssh_image_id"** and replace the content as indicated by the arrow in the picture below with the ID of your custom image.

----End

Using a Linux Agent Image

Step 1 Log in to the SMS console. In the navigation pane on the left, choose **Agents**.

Step 2 Download the Linux Agent installation package to the source server to be migrated.

Step 3 On the source server, decompress the installation package.

tar -zxvf SMS-Agent.tar.gz

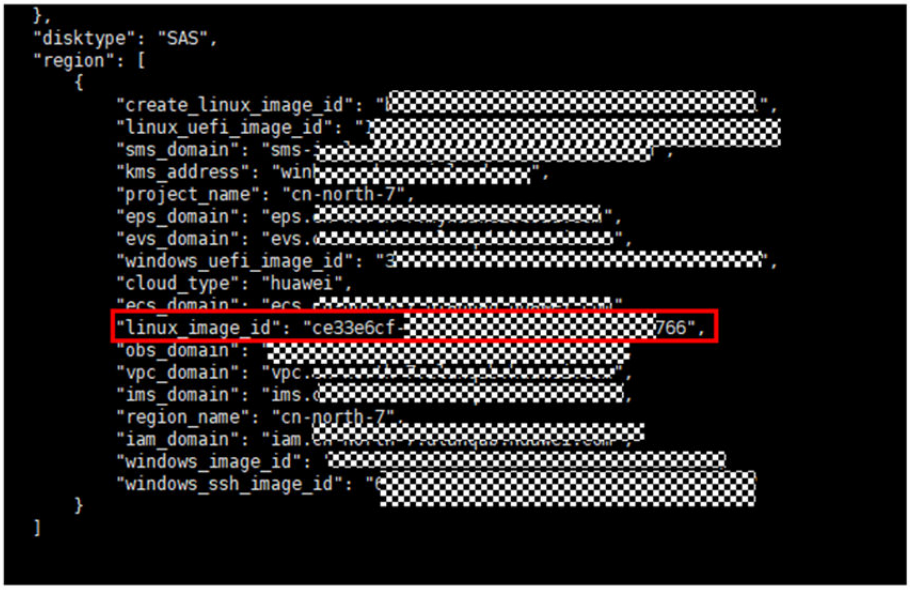
Step 4 Start the Agent.

./startup.sh

Step 5 Enter the AK/SK pair and SMS domain name to start the SMS-Agent.

Step 6 Go to the directory where the SMS-Agent was installed (typically **~\SMS-Agent\agent\config\cloud-region.json**).

Step 7 In the **cloud-region.json** file, search for **"linux_image_id"** and replace the content as indicated by the arrow in the picture below with the ID of your custom image.



----End

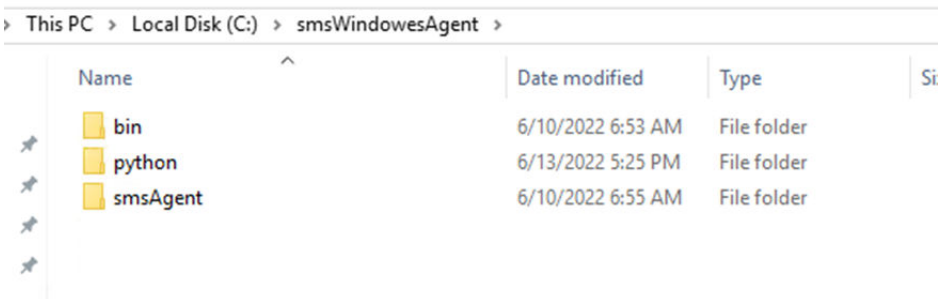
3.5.2 Creating Scripts in Agent Images

Precautions

- You need to prepare scripts based on the OS of the servers to be migrated.
- You need to prepare required scripts on your own. If you need help, contact SMS technical support.
- The script examples below are only for reference.
- You can use the scripts contained in SMS agent images as the basis to create your own scripts. For details, see **Obtaining SMS Agent Image Scripts for Testing Use**.

Windows

Step 1 In the **C:** directory, create a folder and name it **smsWindowesAgent**. In this folder, create three folders and name them **bin**, **Python**, and **smsAgent** respectively.



Folder	Function	Location
bin	Stores the startup scripts and the **peagent** folder.	C:\smsWiondowesAgent\bin
python	Installs Python.	C:\smsWiondowesAgent \python
smsAgent	Stores Python scripts for obtaining metadata.	C:\smsWiondowesAgent \smsAgent
peagent	Stores migration components transferred from source servers.	C:\smsWiondowesAgent\bin \peagnet

Step 2 In the **smsAgent** folder, store the scripts used for obtaining certificates and keys.

SMS-Agent uploads SSH public and private keys to metadata of target servers. The scripts you prepared here will be used to obtain the keys from the metadata. The table below shows the three types of metadata.

Script	Function	Destination File
sms_rsa_part (to be deprecated)	Obtains SSH public keys (for server and identity authentication).	C:\Users\Administrator\.ssh \authorized_keys,C:\ProgramData\ssh \ssh_host_rsa_key.pub
sms_rsa_pri_ part (to be deprecated)	Obtains SSH private keys (for server and identity authentication).	C:\ProgramData\ssh\ssh_host_rsa_key

Script	Function	Destination File
sms_rsa_host_old	Obtains new SSH public keys (for server authentication).	C:\ProgramData\ssh\ssh_host_rsa_key.pub
sms_rsa_host_old_pri	Obtains new SSH private keys (for server authentication).	C:\ProgramData\ssh\ssh_host_rsa_key
sms_rsa_identity	Obtains SSH public key certificates (for identity authentication).	C:\Users\Administrator.ssh\authorized_keys
cert_part (to be deprecated)	Obtains TSL 1.2 authentication public keys.	C:\smsWindowesAgent\bin\peAgent\config\cert.pem
prikey_part (to be deprecated)	Obtains TSL 1.2 authentication private keys.	C:\smsWindowesAgent\bin\peAgent\config\prikey.pem

sms_rsa_part and **sms_rsa_pri_part** obtain the SSH public keys and private keys from metadata and write them to the destination files listed in the table above.

Step 3 In the **bin** directory, add a script to check whether **peagent.exe** is running.

'tasklist /nh /fi "imagename eq peAgent.exe'

- If it is not running, add the following command to start it.

  start cmd /k "C:\smsWindowesAgent\bin\peAgent\peAgent.exe"
- If it is running, end the script.

This script should be executed after the scripts in the **smsAgent** folder are executed.

----End

Linux

Step 1 In the **~** directory, create a folder and name it **smsMetadataAgent**. In this folder, create three folders and name them **bin**, **Python**, and **smsAgent** respectively.

Folder	Function	Location
bin	Stores the startup scripts and the **peagent** folder.	~\smsMetadataAgent\bin

Folder	Function	Location
smsAgent	Stores Python scripts for obtaining metadata.	~\smsMetadataAgent \smsAgent

Step 2 Prepare scripts for obtaining public and private keys from metadata by referring to the Windows section.

Script	Function	Destination File
sms_rsa_part (to be deprecated)	Obtains SSH public keys (for server and identity authentication).	root/.ssh/ authorized_keys, /etc/ssh /ssh_host_rsa_key.pub
sms_rsa_pri_part (to be deprecated)	Obtains SSH private keys (for server and identity authentication).	/etc/ssh/ ssh_host_rsa_key
sms_rsa_host_old	Obtains new SSH public keys (for server authentication).	/etc/ssh/ ssh_host_rsa_key.pub
sms_rsa_host_old_pri	Obtains new SSH private keys (for server authentication).	/etc/ssh/ ssh_host_rsa_key
sms_rsa_identity	Obtains SSH public key certificates (for identity authentication).	/root/.ssh/ authorized_keys
cert_part (to be deprecated)	Obtains TSL 1.2 authentication public keys.	/home/config/cert.pem
prikey_part (to be deprecated)	Obtains TSL 1.2 authentication private keys.	/home/config/prikey.pem

Prepare Linux startup scripts.

----End

Obtaining SMS Agent Image Scripts for Testing Use

Step 1 Log in to the SMS console. In the navigation pane on the left, choose **Agents**.

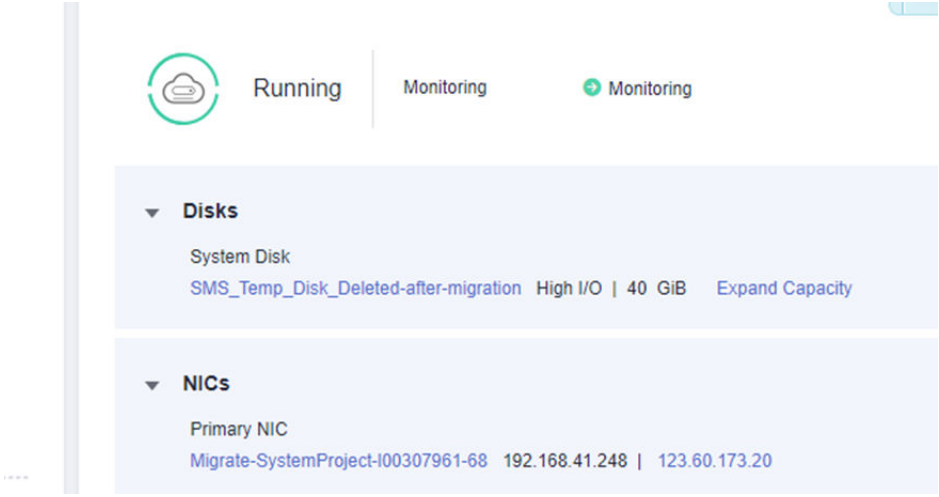
Step 2 Download Windows Agent (Python 2), upload it to the source server, and double-click **SMS-Agent-Py2.exe** to install the SMS-Agent. Click **Finish** to complete the installation.

Step 3 Enter the AK/SK pair and SMS domain name to start the SMS-Agent.

Step 4 Switch back to the SMS console, create a migration task for the source server, and start the task. In this example, an existing ECS is used as the target server. You can also choose to create a new ECS as the target server.

Step 5 When the progress of the **Mount the Agent image and relaunch the target** subtask is 60%, click **Pause**.

Step 6 Check the target server that has a temporary system disk.



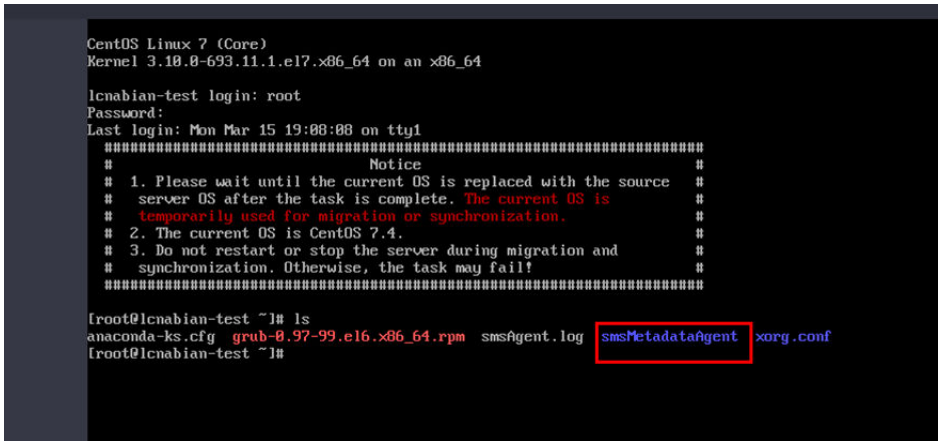
Step 7 Log in to the target server and obtain SMS scripts for testing use.

In Linux, the scripts are stored in **~\smsMetadataAgent**. In Windows, the scripts are stored in **C:\smsWindowesAgent**.

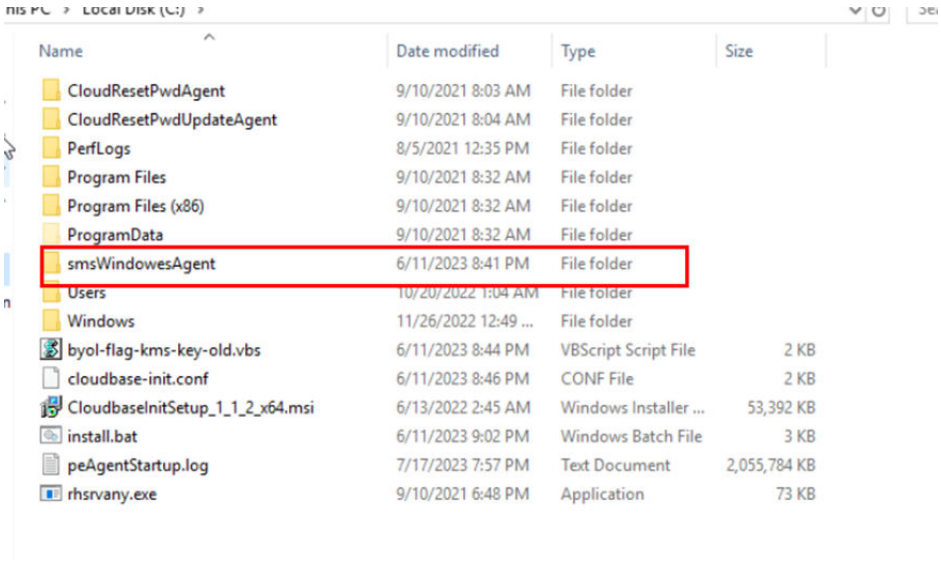
CAUTION

When logging in to the target server, you need to use the password reset plug-in to reset the password. If the password cannot be reset, you can recreate a migration task for the source server and choose to create a new ECS as the target server. Then obtain the login password from SMS.

Location of scripts in Linux



Location of scripts in Windows



----End

3.5.3 Creating a Windows Agent Image

Preparing an ECS

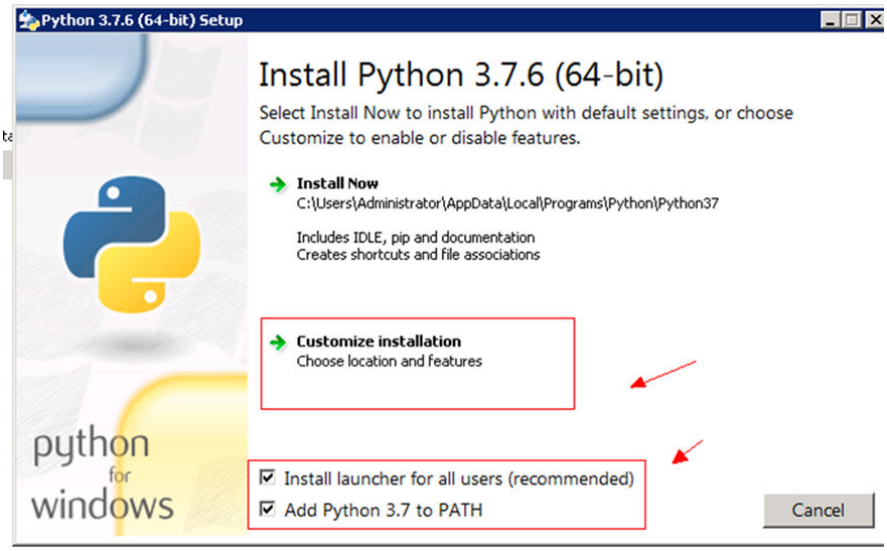
Prepare an ECS that runs Windows Server 2019 Standard 64bit English and has a 40 GB system disk. Windows Server 2019 is used as an example, and you can select another version. Specify a valid password when creating the ECS and name the ECS **SMS**. The official Microsoft image is recommended.

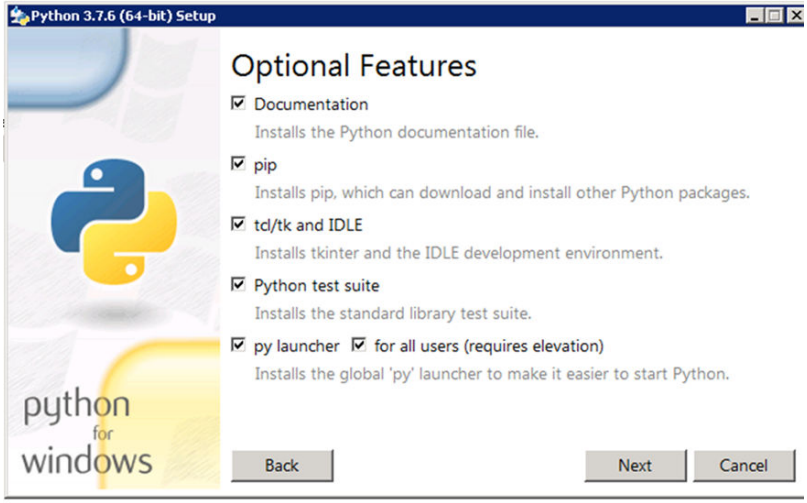
Ensure that the ECS can access the Internet, so that the required tools can be downloaded.

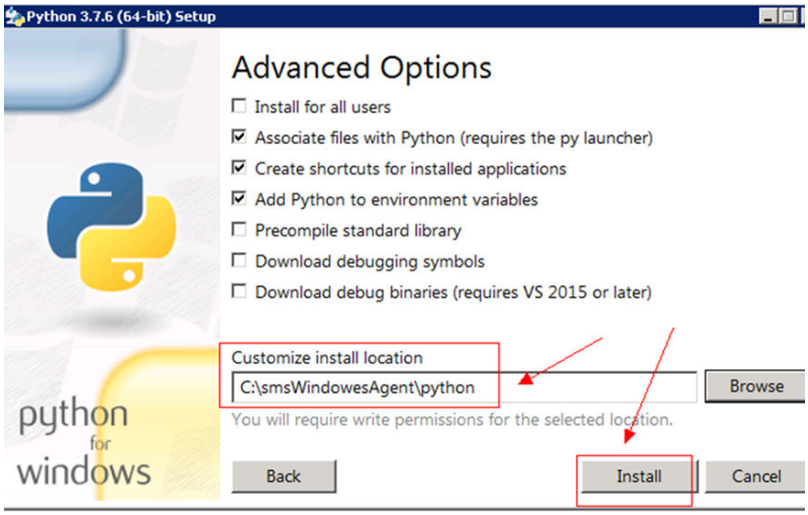
Installing the Required Software

Step 1 Transfer the **smsWindowesAgent** folder created in **Creating Scripts in Agent Images** to the **C:**directory of the ECS. The folder stores the agent image scripts you prepared.

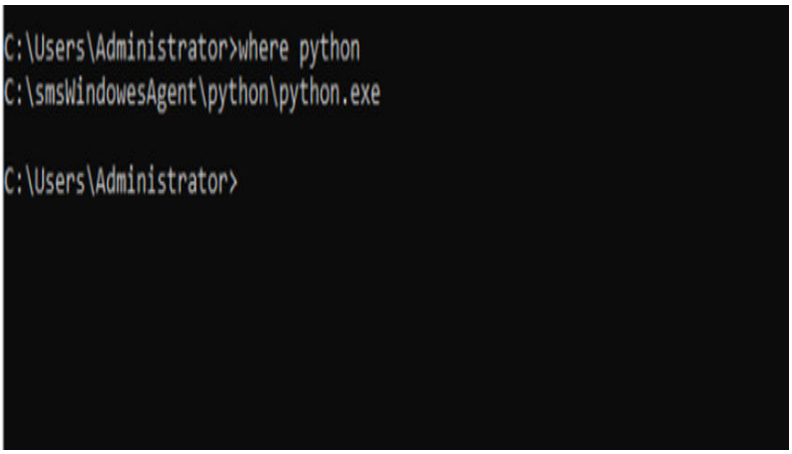
Step 2 Install **Python 3.7.6** to **C:\smsWindowsAgent\Python**. You can select another version as required.







Step 3 Run **where python** to check whether Python has been installed in the specified directory.



----End

Installing requests and ConfigParser

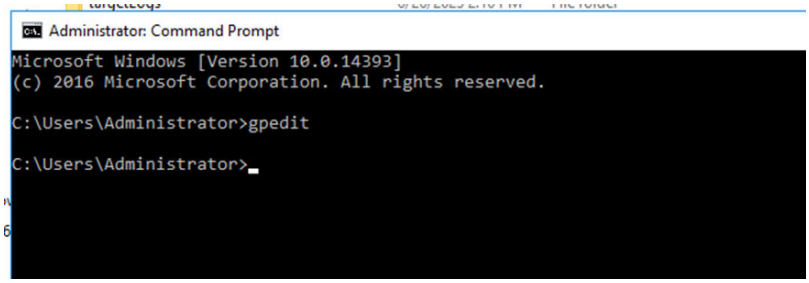
Run the following commands on the ECS to install requests and ConfigParser.

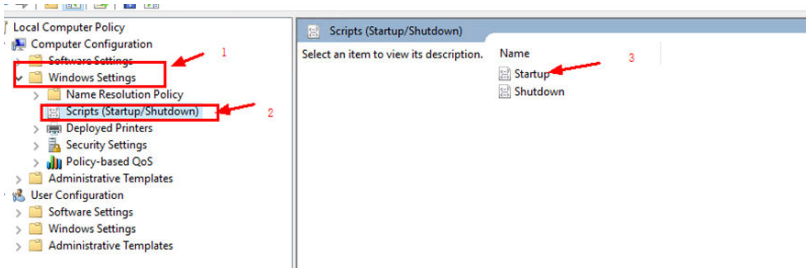
```
pip install requests
pip install configparser
```

Modifying the ECS

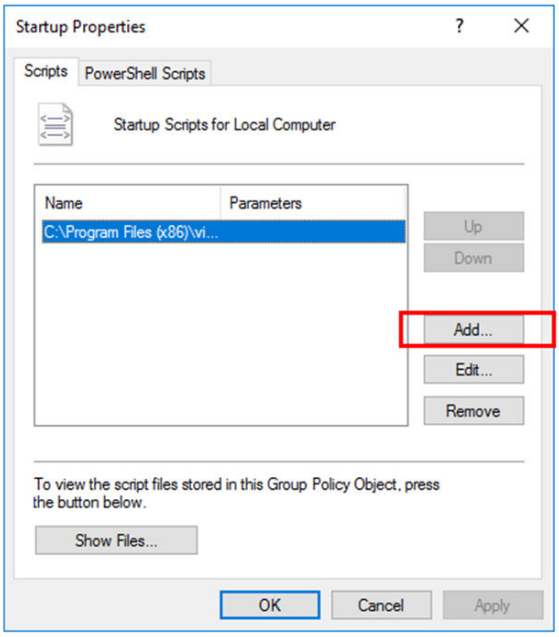
Step 1 Enable scripts to automatically run upon ECS startup.

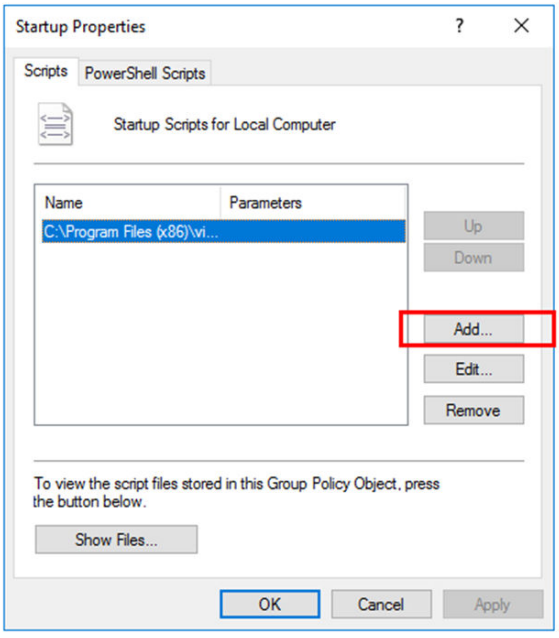
1. Open the cmd and run **gpedit**. In the displayed window, choose **Computer Configuration** > **Windows Settings** > **Scripts (Startup/Shutdown)** > **Startup**.





2. Click **Add** and specify **C:\smsWindowesAgent\bin***Name of script for running Python*.**bat** for **Script Name**.





Step 2 Install OpenSSH.

1. Right-click the **Start** icon or press **Win** and **X** keys. In the displayed menu, choose **Windows PowerShell (Administrator)**. In the displayed window, run the following command:

```
Add-WindowsCapability -Online -Name OpenSSH.Server~~~~0.0.1.0
```

2. After the installation is complete, restart the OS for the installation to take effect. Start the sshd and ssh-agent services and set them to automatically run at startup.

   Start sshd.

   ```
   Start-Service sshd
   ```

   Enable sshd to automatically run at startup.

   ```
   Set-Service sshd  Automatic
   ```

   Start ssh-agent.

   ```
   Start-Service ssh-agent
   ```

   Enable ssh-agent to automatically run at startup.

   ```
   Set-Service ssh-agent -StartupType Automatic
   ```

3. Go to the **C:\ProgramData directory** and add the following content to the **sshd_config** file:

   PasswordAuthentication no

Step 3 Install OpenStack.

Download VMTools.

Decompress the downloaded package, double-click the extracted file, and find the required drivers in **./vmtools-windows/upgrade/windows** *XX*/**drivers**.

Copy all driver files to the specified directory.

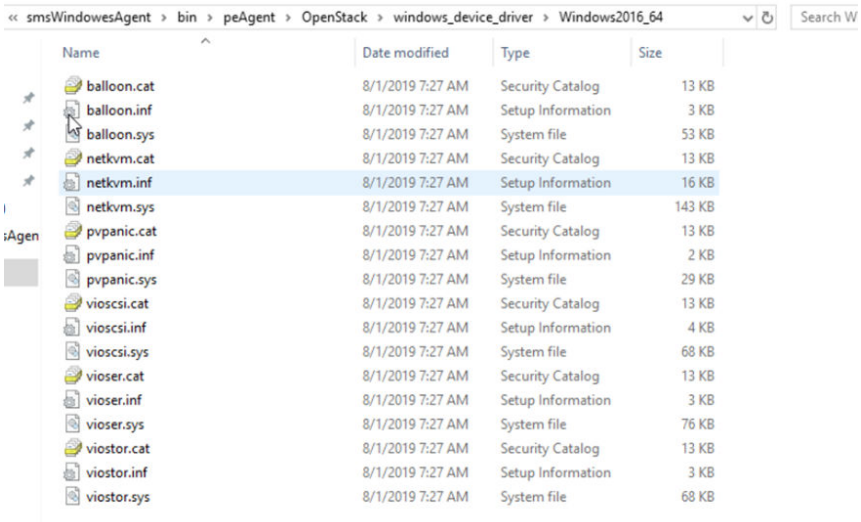
Windows Server 2016_64bit is used here as an example.

Copy all files in **upgrade\windows 2016_64\drivers\viostor** to **C:\smsWindowsAgent\bin\peAgent\OpenStack\windows_device_driver\windows2016_64**.

Copy files in the rest of folders under **upgrade\windows 2016_64\drivers** to **C:\smsWindowsAgent\bin\peAgent\OpenStack\windows_device_driver\windows2016_64**.

The picture below shows the files copied to the **C:\smsWindowsAgent\bin\peAgent\OpenStack\windows_device_driver\windows2016_64** directory.

Copy files required by other Windows versions to the corresponding directories.



Step 4 Open ports 8899 and 8900 on the ECS.

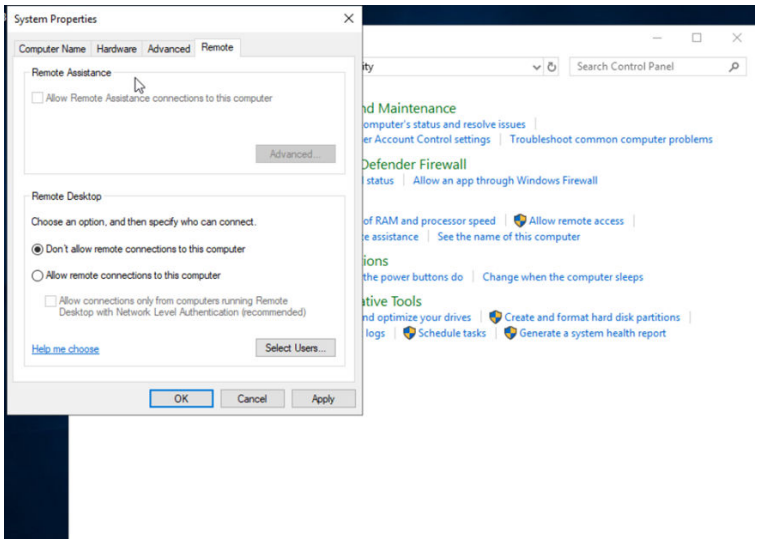
```
netsh advfirewall firewall add rule name=peagent dir=in action=allow protocol=TCP localport=8899
netsh advfirewall firewall add rule name=ntcldst dir=in action=allow protocol=TCP localport=8900
```

----End

(Optional) Hardening Security

Step 1 Disable remote login.

Open the Control Panel, choose **System and Security** > **System** > **Allow remote access**, and select **Don't allow remote connections to this computer**.



Step 2 Disable the WinRM service.

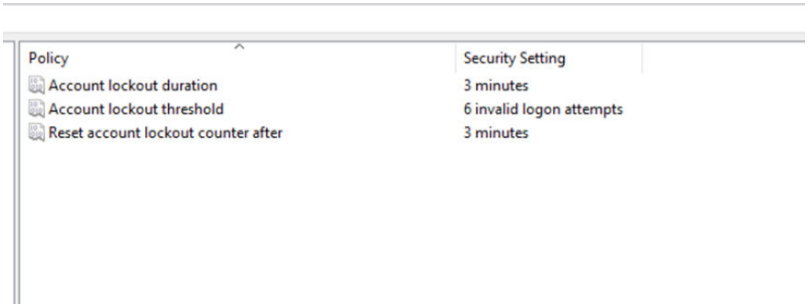
1. Open the cmd or PowerShell as an administrator.
2. Stop the WinRM service.

   net stop winrm
3. Disable the WinRM service.

   sc config winrm start= disabled

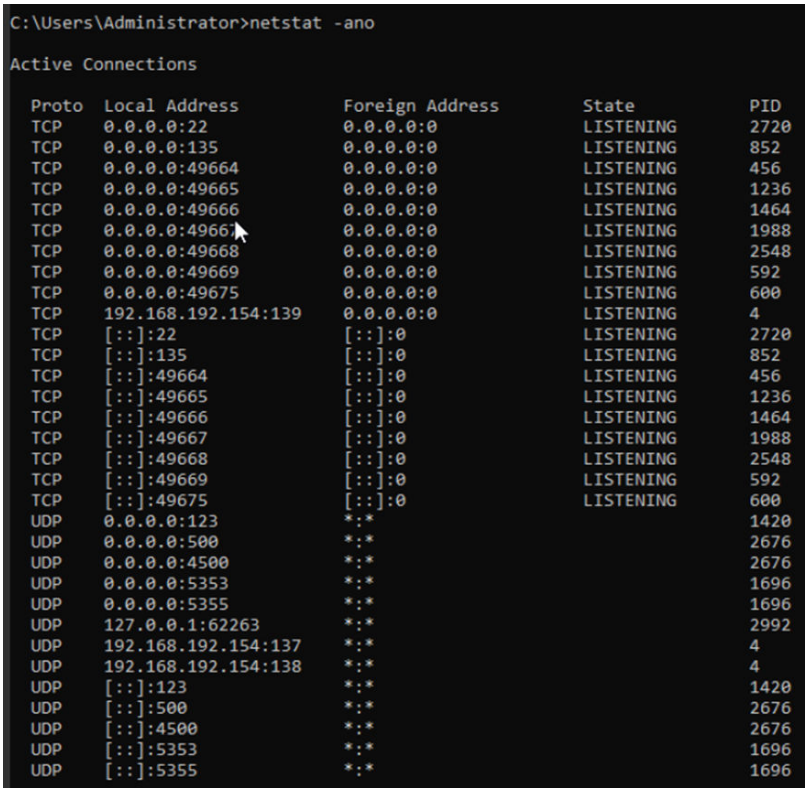
Step 3 Set a password login policy to block brute-force attacks.

1. Open the cmd or PowerShell as an administrator.
2. Run the **gpedit.msc** command to start **Local Group Policy Editor**.
3. In the displayed window, choose **Computer Configuration** > **Windows settings** > **Security Settings** > **Account Policy** > **Account Lockout Policy**. Set the account locking policy shown in the following figure. This policy indicates that if there are 6 consecutive unsuccessful login attempts, the account will be blocked for 3 minutes.



Step 4 Close listening ports in the Windows firewall.

1. Open the cmd and run the **netstat -ano** command to check all listening ports.



2. Close all dynamic ports (49152-65535) and port 135 used for listening.

```
netsh advfirewall firewall add rule name=Tcp_disable dir=in action=block protocol=TCP localport=135,3389,5985,5986,49152-65535
```

3. Close all UDP ports.

```
netsh advfirewall firewall add rule name=Tcp_disable dir=in action=block protocol=UDP localport=any
```

----End

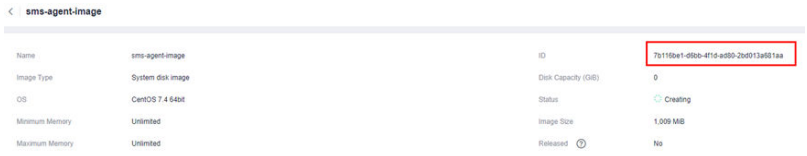
Creating an Image

Step 1 Log in the IMS console.

Step 2 Click **Create Image**.

Step 3 Create a system disk image for the ECS as prompted.

Step 4 View the ID of the created image.



----End

3.5.4 Creating a Linux Agent Image

Preparing an ECS

Prepare a Linux ECS using a public image.

Set a password for the ECS. Install Python 3 on the ECS if it is not included in the public image.

Preparing Scripts

For details, see **Creating Scripts in Agent Images**.

Modifying the ECS

Step 1 Install necessary components.

Install Python dependencies. Below is just an example. Install the latest version of Python.

```
yum install python36
ln -s /usr/bin/python36 /usr/bin/python3
yum install python36-setuptools
wget https://files.pythonhosted.org/
packages/ae/e8/2340d46ecadb1692a1e455f13f75e596d4eab3d11a57446f08259dee8f02/pip-10.0.1.tar.gz
tar xvf pip-10.0.1.tar.gz
cd pip-10.0.1
python3 setup.py install
pip3 install requests
```

Step 2 Modify the **/etc/rc.local** file.

```
ln -s /etc/rc.d/rc.local /etc/rc.local     #If files /etc/rc.d/rc.local and /etc/rc.local are not linked t each other in the public image, the scripts may not be executed at startup.
chmod 766 /etc/rc.d/rc.local
```

Step 3 Install basic system components.

```
yum install expect
yum install lvm2
yum install dosfstools      #mkfs.vfat is supported.
rpm -ivh grub-0.97-99.el6.x86_64.rpm      #This component is only needed when the servers to be migrated use GRUB 1. Download this component at the grub official website.
```

Step 4 Modify **/etc/mke2fs.conf**.

Delete **64bit** from the **ext4** item. Otherwise, GRUB 1 may fail to be installed in the Ext4 file system.

```
[root@luojiandong-s ~]# vim /etc/mke2fs.conf

[defaults]
    base_features = sparse_super,filetype,resize_inode,dir_index,ext_attr
    default_mntopts = acl,user_xattr
    enable_periodic_fsck = 0
    blocksize = 4096
    inode_size = 256
    inode_ratio = 16384

[fs_types]
    ext3 = {
        features = has_journal
    }
    ext4 = {
        features = has_journal,extent,huge_file,flex_bg,uninit_bg,dir_nlink,extra_isize,64bit
        inode_size = 256
    }
    ext4dev = {
        features = has_journal,extent,huge_file,flex_bg,uninit_bg,dir_nlink,extra_isize
        inode_size = 256
        options = test_fs=1
    }
```

Step 5 Change partition UUIDs.

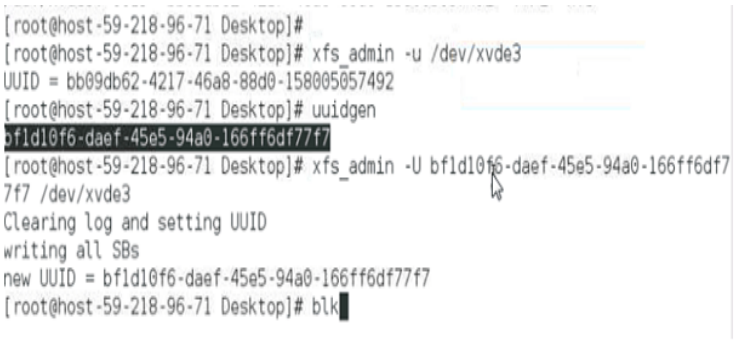
1. Detach the system disk from the ECS and attach it to a temporary ECS as a data disk.
2. On the temporary ECS, use **uuidgen** to generate new UUIDs and use **tune2fs –U** to assign new UUIDs to partitions.
   a. Run the **blkid** command on the temporary ECS to query the UUID of each partition.

```
[root@host-59-218-96-71 Desktop]# blkid
/dev/xvda1: UUID="012b7e35-22c9-4f4c-ad68-d42fe74f3b8e" TYPE="xfs"
/dev/xvda2: UUID="98e96267-50ce-4dad-b257-a1ff9f60ff72" TYPE="swap"
/dev/xvda3: UUID="bb09db62-4217-46a8-88d0-158005057492" TYPE="xfs"
/dev/xvde1: UUID="012b7e35-22c9-4f4c-ad68-d42fe74f3b8e" TYPE="xfs"
/dev/xvde2: UUID="98e96267-50ce-4dad-b257-a1ff9f60ff72" TYPE="swap"
/dev/xvde3: UUID="bb09db62-4217-46a8-88d0-158005057492" TYPE="xfs"
[root@host-59-218-96-71 Desktop]#
[root@host-59-218-96-71 Desktop]# xfs_admin -u /dev/xvde3
UUID = bb09db62-4217-46a8-88d0-158005057492
[root@host-59-218-96-71 Desktop]#
```

   b. Run the **uuidgen** command to generate a new UUID.

```
/dev/xvde3: UUID="bb09db62-4217-46a8-88d0-158005057492" TYPE="xfs"
[root@host-59-218-96-71 Desktop]#
[root@host-59-218-96-71 Desktop]# xfs_admin -u /dev/xvde3
UUID = bb09db62-4217-46a8-88d0-158005057492
[root@host-59-218-96-71 Desktop]# uuidgen
bf1d10f6-daef-45e5-94a0-166ff6df77f7
[root@host-59-218-96-71 Desktop]# xfs_admin -U bf1d10f6-daef-45e5-94a0-166ff6df7
7f7
```

   c. Run the **tune2fs -U** <New_UUID> <Device> or **xfs_admin -U** <New_UUID> <Device> command to assign the new UUID to the partition on the data disk.



d. Change the UUID of the partition in **/etc/fstab** and **/boot/grub2/grub.cfg** to the newly assigned UUID.

   This is to ensure that OS in the agent image disk can be started.

e. Attach the disk back to the original ECS as the system disk and test whether the OS can start up.

Step 6 Transfer the **smsMetadataAgent** folder where stores the necessary scripts to the ECS and enable these scripts to automatically run at startup. For details, see **Creating Scripts in Agent Images**.

Step 7 Modify the sshd configuration file to disable password login.

Step 8 Delete residual settings. Ensure that there is no **/data** directory, there are no SMS log files in the **/root** directory, and there are no residual certificates in the **/etc/ssh** directory.

----End

(Optional) Hardening Security

Step 1 Add the following content to the **sshd_config** file.

```
MaxAuthTries 6
LoginGraceTime 60
PasswordAuthentication no
```

Step 2 Disable history.

1. Start the Shell and run the following command:
   ```
   sudo nano ~/.bashrc
   ```
2. Add the following content to the end of the file:
   ```
   unset HISTFILE
   ```
3. Save the file and exit. Run the following command for the modification to take effect:
   ```
   source ~/.bashrc
   ```

Step 3 Prevent brute-force attacks.

Add the content below to the **/etc/pam.d/password-auth** file.

```
auth sufficient pam_faillock.so authsucc audit deny=3 even_deny_root unlock_time=60
```

This can prevent any user from login for 30 seconds after 3 failed login attempts.

Step 4 Set the password complexity requirements.

In the **/etc/pam.d/system-auth** file, append **enforce_for_root minlen=8 ucredit=-1 lcredit=-1 dcredit=-1 ocredit=-1** to the end of the row that starts with **password requisite pam_pwquality.so try_first_pass**.

```
password requisite pam_pwquality.so try_first_pass local_users_only enforce_for_root minlen=8 ucredit=-1 lcredit=-1 dcredit=-1 ocredit=-1
```

Step 5 Change the umask value. Change the value of umask to **027**. The **umask** command is used to set the default permissions on files and directories.

1. Open the Shell and run the following command to open the **.bashrc** file:
   ```
   nano ~/.bashrc
   ```
2. Add the following content to the end of the file:
   ```
   umask 027
   ```
3. Save and close the file. Run the following command to make the change take effect:
   ```
   source ~/.bashrc
   ```

Step 6 Delete residual system tools because keeping them only increases the attack surface of the system and mislead security software.

Delete the following residual tools:

- tcpdump, sniffer, Wireshark, Netcat, and other WinPcap-based sniffing tools
- gdb, strace, readelf, cpp, gcc, dexdump, mirror, JDK, and other self-developed tools or scripts used only in the development and debugging phase

----End

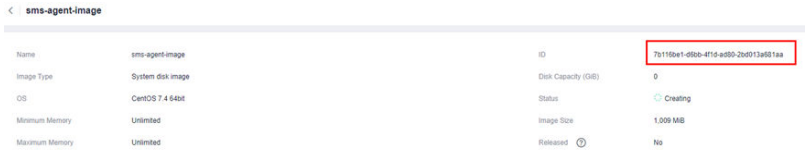
Creating an Image

Step 1 Log in the IMS console.

Step 2 Click **Create Image**.

Step 3 Create a system disk image for the ECS as prompted.

Step 4 View the ID of the created image.



----End

4 FAQs

4.1 Product Consulting

4.1.1 Can I Migrate Physical Servers and VMs from Other Clouds to the Cloud Platform Using SMS?

Yes.

SMS makes it easy to migrate physical servers in data centers and VMs on various popular private and public clouds to ECSs on the cloud platform. In principle, all x86 servers can be migrated to the cloud platform using SMS.

For details about the supported OSs, see **What Source Server OSs Are Supported by SMS and Are There Any Restrictions on Using SMS?**

4.1.2 Can I Migrate ECSs to an On-premises Environment or Another Cloud Using SMS?

SMS does not support the direct migration of ECSs to on-premises environments or other clouds.

4.1.3 Can I Ask the Technical Support to Help Me Move Servers?

We do not directly migrate your services. For how to use SMS to implement migration, see SMS Documentation.

4.1.4 Can I Migrate Workloads to a DeH, or DeC Using SMS?

DeH

Yes. Before the migration, purchase a DeH. For details, see . When configuring the target server, select the DeH that you purchased.

Dedicated Cloud

Yes. Before the migration, purchase a DeC. For details, see . When configuring the target server, select the enabled DeC.

4.1.5 Does SMS Support Resumable Data Transfer?

Yes. However, the Agent or source server cannot be restarted during a Windows migration. This is because the address corresponding to the incremental data is stored in the memory. If the Agent is restarted, incremental synchronization cannot be performed.

4.1.6 How Do I Migrate an ECS from One Account to Another?

To migrate an ECS from one account to another, perform the following operations:

1. Install the Agent on the ECS under the first account, but when starting the Agent, enter the AK/SK pair of the destination account. To learn how to install the Agent, see **Installing the Windows Agent** or **Installing the Linux Agent**.
2. Log in to the management console using the destination account, **configure the target server**, **start the replication**, and **launch the target server**.

   NOTE

   For details about how to migrate an ECS from one region to another, see **How Do I Migrate an ECS from One Region to Another Using SMS?**

4.1.7 How Do I Migrate an ECS from One Region to Another Using SMS?

Supposed that you want to migrate an ECS from region A to region B. You need to install the Agent on the ECS in region A. When creating a migration task, select region B as the target region.

NOTE

For details about migration between accounts, see **How Do I Migrate an ECS from One Account to Another?**

4.1.8 Will My Services on the Source Server Be Interrupted During Migration?

No. The migration consumes the source bandwidth, and has little impact on other source resources such as CPU and memory.

Before the migration, you are advised to check the source bandwidth usage and properly allocate bandwidth to the migration process.

4.1.9 How Do I Create an AK/SK Pair for an Account?

Scenarios

An access key comprises an access key ID (AK) and secret access key (SK). It is used as a long-term identity credential to sign your requests for the cloud

platform APIs. Like a user name and password, you must use both the AK and SK together to authenticate your requests. Manage your access keys as securely as you do your user name and password.

When creating a migration task, you need to enter an AK/SK pair for authentication. If you use an account for migration, you can create an AK/SK pair for the account by referring to **Access Keys**.

CAUTION

During the migration, do not delete the AK/SK pair, or the migration will fail.

4.1.10 How Do I Create an AK/SK Pair for an IAM User?

Scenarios

When creating a migration task, you need to enter an AK/SK pair for authentication. To safeguard the resources in your account on the cloud platform, you are advised to create a IAM user in the account, assign permissions to the user, and create an access key for the user. This section describes how to create an AK/SK pair for an IAM user.

Procedure

Step 1 Create a user group and assign permissions to it.

- If the IAM users who will be added to this group need all SMS permissions, attach the system-defined policies supported by SMS, including **SMS FullAccess**, **OBS OperateAccess**, **ECS FullAccess**, and **VPC FullAccess**, to the group.
- If the IAM user only needs specific SMS permissions, create custom policies and attach these policies to the user group. For details, see **SMS Custom Policies**.

  NOTE

  Compared with system-defined policies, custom policies provide more fine-grained and secure permissions control.

Step 2 Create an IAM user and add it to the user group.

Create a user on the IAM console and add the user to the group created in **1**.

Step 3 Log in to the management console as the IAM user. Create an AK/SK pair by referring to **Access Keys**.

----End

4.1.11 How Do I Migrate a Linux Source Server as a Non-root User?

Scenarios

If you must use a non-root user account to perform the migration, ensure that the user has the required permissions before creating a migration task.

Procedure

Step 1 For a hypothetical user, **test**, check whether the user is included in **/etc/passwd**. If it is not, run the following two commands to add the user and set the password:

If it is, confirm that user **test** has a **/home** directory. If the user does not have a home directory, add one.

```
useradd -m test
passwd test
```

Step 2 Modify the **/etc/sudoers** file.

1. Add the following information to the end of the **/etc/sudoers** file based on the OS version:
   - Debian and Ubuntu
     ```
     test    ALL=(ALL:ALL)    ALL
     test    ALL=(ALL:ALL)    NOPASSWD:ALL
     ```
   - Other distributions:
     ```
     test    ALL=(ALL)    ALL
     test    ALL=(ALL)    NOPASSWD:ALL
     ```
2. If **Defaults requiretty** is in the **/etc/sudoers** file, comment out it.

CAUTION

These modifications to the **sudoers** file enable the user to execute administrator level commands without entering a password. After the migration is completed, you need to remove the added lines, or an exception occurs.

Step 3 After the permissions are configured, switch to a regular account and run the following command to start the Agent:

```
sudo ./startup.sh
```

----End

4.1.12 What Information Does SMS Collect About Source Servers?

SMS uses the Agent to collect source server details to evaluate the migration feasibility and provide data required for selecting or configuring target servers. **Table 4-1** lists the data collected from a Windows server. **Table 4-2** lists the data collected from a Linux server. All collected data is used for migration only.

Table 4-1 Collected Windows server details

Item	Sub-Item	Usage
Environment information	OS version	Used for migration feasibility checks. Only source servers with OSs included in **Supported Windows OSs** can be migrated.
	Firmware type	Used for migration feasibility check. The source server can be booted from BIOS or UEFI.
	CPU	Used for recommending the target server flavor.
	Memory	Used for recommending the target server flavor.
	System directory	Used for configuring the target server. After the migration is complete, it will be used to restore the registry.
	Disk partition style	Used for configuring the target server. Before the migration, the disks of the target server must be formatted to be the same as those of the source server.
	File system	Used for migration feasibility check. Only the NTFS partitions can be migrated.
	Available space	Used for migration feasibility check. If there is not enough space on a source server partition, the migration may fail.
	OEM system check	Used for migration feasibility check. If the system is an OEM system, the OS needs to be reactivated after the migration.
	Driver files	Used for migration feasibility check. The source server must have basic disk drivers.
	System services	Used for migration feasibility check. Volume Shadow Copy Service (VSS) must be available on the source server.
	User permissions	Used for migration feasibility check. You must have the administrator permissions to run the Agent.

Item	Sub-Item	Usage
Disk information	• Disk name • Disk partition style • Disk size • Used space	Used for checking whether the disk specifications of the target server meet the migration requirements.

Table 4-2 Collected Linux server details

Item	Sub-Item	Usage
Environment information	OS version	Used for migration feasibility checks. Only source servers with OSs included in **Supported Linux OSs** can be migrated.
	CPU	Used for recommending the target server flavor.
	Memory	Used for recommending the target server flavor.
	Paravirtualization	Used for migration feasibility check. SMS does not support migration of paravirtualized source servers.
	Firmware type	Used for migration feasibility check. The source server can be booted from BIOS or UEFI.
	Boot mode	Used for migration feasibility check. The source server must be booted from BIOS.
	rsync	Used for evaluating synchronization feasibility. SMS synchronization depends on rsync on the source server.
	Raw device	Used for migration feasibility check. The source servers to be migrated cannot contain raw devices.
	Disk partition	Used for migration feasibility check. The source disk partition style must be Main Boot Record (MBR) or GUID Partition Table (GPT).
	Disk partition style	Used for configuring the target server. Before the migration, the disks of the target server must be formatted to be the same as those of the source server.

Item	Sub-Item	Usage
	File system	Used for migration feasibility check. The file systems on the source server must be Ext2, Ext3, Ext4, VFAT, XFS, or Btrfs.
Disk information	• Disk name • Disk partition style • Disk size • Used space	Used for checking whether the disk specifications of the target server meet the requirements.

4.1.13 How Do I Select a Target Server?

A target server must meet the requirements described here. If no existing ECSs meet these requirements, you can create one. For details, see "How Do I Create an ECS?" in *Elastic Cloud Server User Guide.*

- A target ECS running Windows must have at least 2 GB of memory.
- A target server must have at least as many disks as the source server, and each disk on the target server must be at least as large as the paired source disk.
- A target server must run the same type of OS as the source server. Otherwise, OS inconsistency may occur.

4.1.14 How Do I Create an ECS?

Scenarios

Source servers can be migrated to the ECSs on the cloud platform. You can create one or more ECSs as target servers before the migration.

Procedure

Step 1 Log in to the management console.

Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Compute** > **Elastic Cloud Server**.

The **Elastic Cloud Server** page is displayed.

Step 4 Click **Create ECS** and configure basic parameters on the displayed page.

For more information, see section "Creating an ECS" in *Elastic Cloud Server User Guide*.

NOTE

- A target server running Windows must have at least 2 GB of memory.
- A target server must run the same type of OS as the source server.
- A target server must have at least as many disks as the source server, and each disk on the target server must be at least as large as the paired source disk.

Step 5 Click **Apply Now**.

After the ECS is created, it will be displayed in the ECS list.

----End

4.1.15 What Is the Block-Level Migration?

In block-level migrations, a block refers to a disk block. A disk block is the minimum logical unit of the file system for managing disk partitions. Disk blocks are similar to clusters in Windows. A block is also the minimum logic unit of disks used by OSs and software. The smallest unit for disk read or write is a sector. A sector is a physical area on the disk. The read and write operations to disk blocks are performed in sectors. Generally, a file is stored in several blocks, and one block maps to several physical sectors.

In block-level migrations, file systems are migrated by blocks. If the network is interrupted during the migration, only impacted blocks need to be migrated again after the network recovers. If files are modified during the migration, only modified blocks need to be synchronized after the migration. In file-level migrations, various tools like TAR and SSH or other transmission protocols are used for remote replication. If a file is changed during decompression or the network is interrupted during migration, the migration will fail. In addition, if a file is changed during incremental data synchronization, the file needs to be synchronized again. In this case, all the blocks of the file must be synchronized. So, the synchronization efficiency is low

4.1.16 What are Valid Data Blocks?

Valid data blocks are **blocks** that are allocated or used by a file system, for example, Ext. SMS migrates only valid data blocks. For data blocks that are not allocated or used and can be allocated by the system, SMS does not migrate them during migration. This reduces how much data needs to be migrated. The migration efficiency is improved.

4.1.17 Why Is the OS Name of the Target ECS Displayed on the ECS Console Different from That of the Source Server?

It is the name of the image used for creating the ECS rather than the ECS OS that is displayed on the ECS console.

- If you use an existing ECS as the target server, the name of the image used to create the ECS is displayed on the ECS console.
- If you choose to automatically create an ECS as the target server, the name of the public image selected by SMS for the ECS is displayed on the ECS console.

NOTICE

To display the same OS name as the source server on the ECS console, create an ECS using an image whose name is the same as the source server OS, and use this ECS as the target server.

4.1.18 How Do I Determine Whether a Migration Task Is Complete?

If the status of a migration task changes to **Finished**, the migration task is complete.

4.1.19 Can I Migrate Only Some Services on the Source Server?

No. SMS only supports whole server migration. If you want to migrate only the databases on source servers, Data Replication Service (DRS) can help you.

4.1.20 Can the Target Server Run a Different Type of OS from the Source Server?

The OS types of target and source servers must be the same, but the OS versions can be different.

For example, if the source server runs Windows Server 2008, the target server may run Windows Server 2012; if the source server runs Ubuntu, the target server may run CentOS.

4.1.21 What Determines the Specifications of a Target Server?

The specifications of a target server are determined by the option you select when you configure the target server.

- Use existing

  If you select this option, the target server will have the same specifications as the existing server that you choose.
- Create new

  If you select this option, the target server will have the specifications that you configure in the **Advanced Settings** area.

4.1.22 Which Download Option Should I Choose When I Download the Windows Agent?

After you log in to the SMS console, and click **Agents** in the left navigation pane, you can see two download options in each Windows Agent pane.

- **Agent**: Download the Agent installation package.

- **SHA256 File**: Download the hash value of the Agent installation package, which is used to verify the integrity of the downloaded package.

4.1.23 How Does SMS Differ from IMS in the Migration Scenario?

This following describes the differences between SMS and IMS in terms of application scenarios, migration processes, and service continuity.

Application Scenario

- IMS is used to migrate on-premises servers to the cloud. IMS enables you to create images for source servers and use the images for migration. The common application scenarios are: deploying a specified software environment, batch deploying software environments, and backing up server running environments.
- SMS is used to migrate x86 physical or virtual servers on premises, private or public clouds to the cloud platform.

Migration Process

- If you use IMS for migration, you need to create images for source servers and then use the images to create target servers.
- If you use SMS for migration, you need to install and start the Agent on each source server and start the migration.

Service Continuity

- If you use IMS for migration, your services need to be stopped for long time for image creation.
- If you use SMS for migration, your services do not have to go down during the migration. You only need to pause services briefly for service cutover before the final synchronization. After the final synchronization is complete, you can start services on the target server. SMS ensures minimal downtime.

  NOTE

  Service cutover refers to switching services from the source to the target.

4.1.24 How Do I Display the OS Name of a Target Server on the ECS Console?

Symptom

On the ECS console, you found that the OS name of your target server was different from the actual OS name of the server.

NOTE

This is a normal event resulting from a limitation of the ECS console.

Possible Causes

The ECS console displays the image name of an ECS, not the OS name. The two names may be different. When you configure the target server:

- If you choose to automatically create an ECS as the target server, an SMS-defined image name will be displayed for the new ECS on the ECS console, such as **LinuxServer** or **WindowsServer**.
- If you choose to use an existing ECS as the target server, the image name of the existing ECS is displayed on the ECS console.

Solution

To display the actual OS name of your target server on the ECS console, perform the following steps:

Step 1 Obtain an image file based on the source server OS.

Step 2 Upload the image file to an OBS bucket.

Step 3 Use the image file to create a private image.

1. Log in to the management console and click **Image Management Service** under **Compute**.
2. On the **Image Management Service** page, click **Create Image**.
3. Set **Type** to **Import Image** and **Image Type** to **System disk image**.
4. Select the image file uploaded to your OBS bucket.
5. Select **ECS system disk image** for **Function** and **x86** for **Architecture**. Set **Boot Mode** to the actual boot mode of the source server.

   You can see the boot mode of the source server on the SMS console. For more information, see **Checking the Firmware Type of a Source Server**.
6. Set **OS** to the source server OS. If the source server OS is not an available option, select **Other** from the drop-down list.
7. Set **System Disk** based on the system disk of the source server. If the source system disk is smaller than 40 GB, set **System Disk** to **40 GB**.
8. Set **Name** to the source server OS. The name you specified here will be displayed on the ECS console.
9. Select an enterprise project for the target server. If no other enterprise projects are available, select **Default**.

Step 4 Confirm the configuration details, select **I have read and agree to the Statement of Commitment to Image Creation and Image Disclaimer**, and click **Next**. On the **Resource Details** page that is displayed, click **Submit**. Wait for the image creation to complete.

Step 5 If you have an ECS suitable as a target server, use this image to change the OS of the ECS. If you have no suitable ECS available, use this image to create one.

Step 6 When configuring the target server on the SMS console, select the one you prepared above. For more details, see **Configuring the Target Server**.

----End

Checking the Firmware Type of a Source Server

After the Agent is installed and started on the source server, click the source server name on the **Servers** page of the SMS console. On the **Basic Information** tab page, in the **Source Server** area, you can view the firmware type of the source server.

4.1.25 What Are the Snapshots of a Target Server Used for?

SMS creates the following types of snapshots for each target server disk:

- Cutover snapshots: After a migration is complete, SMS creates a snapshot for each target server disk before the service cutover. These snapshots are used for rollback if any service faults happen. Old snapshots are deleted and new snapshots are created automatically whenever the target server is launched again.

  NOTE

  It is recommended that these snapshots are deleted after your services are running smoothly on the target server.

- Synchronization snapshots: For a Windows server migration or Linux block-level migration, after the source data is migrated and synchronized and before the target server is launched, SMS creates a snapshot for each target server disk to ensure data consistency between the source and target.
- Clone snapshot: When you clone a target server, SMS creates a snapshot for each target server disk. These snapshots are used to clone the target server and put the migration status back to continuous synchronization after the clone is complete.

4.1.26 In a Linux File-Level Migration, How Do I Exclude Directories from Migration and Synchronization?

Scenario

When you migrate a Linux server using the file-level migration method, you can exclude the files or directories that are no longer needed from the migration. After the migration is complete, if you need to synchronize only some incremental data to the target server, you can exclude the files or directories that do not need to be synchronized from the synchronization.

Procedure

Step 1 Log in to the SMS console.

Step 2 In the navigation pane on the left, choose **Servers**.

Step 3 In the server list, locate the source server to be migrated, and click **Configure** in the **Target** column.

Step 4 On the **Configure Basic Settings** tab, select **Advanced Options**.

Step 5 Configure **Exclude Migration Paths**, **Exclude Sync Paths**, and **Include Sync Paths** by referring to the following table. You can configure both directory paths and file paths, for example, **/root/data/path,/data/file.txt**.

Table 4-3 Parameter description

Parameter	Description	Remarks
Exclude Migration Paths	Excludes directory paths and file paths you do not want to migrate from the full migration.	• Absolute paths are required. • SMS does not check whether the configured paths exist. Make sure you have specified existing, correct paths. • Use commas (,) to separate multiple paths. • The **Exclude Migration Paths** settings will become invalid in incremental synchronizations. If you do not want to synchronize these directories or files, add the absolute paths to **Exclude Sync Paths**. • You can configure **Exclude Sync Paths** and **Include Sync Paths** at the same time. **Exclude Sync Paths** overrides **Include Sync Paths**. If the same paths are configured for **Exclude Sync Paths** and **Include Sync Paths**, **Exclude Sync Paths** takes precedence, and the configured paths will not be synchronized.
Include Sync Paths	Includes absolute paths of the directories and files you want to synchronize in incremental synchronizations. Other paths will be skipped during synchronizations.	
Exclude Sync Paths	Excludes absolute paths of the directories and files not to be synchronized from incremental synchronizations. Data in the excluded paths will not be synchronized.	

----End

Related Operations

After you configure the target server or start the migration task, if you want to change the settings of **Exclude Migration Paths** and **Exclude Sync Paths**, pause the migration task, and choose **More** > **Advanced Options** in the **Operation** column.

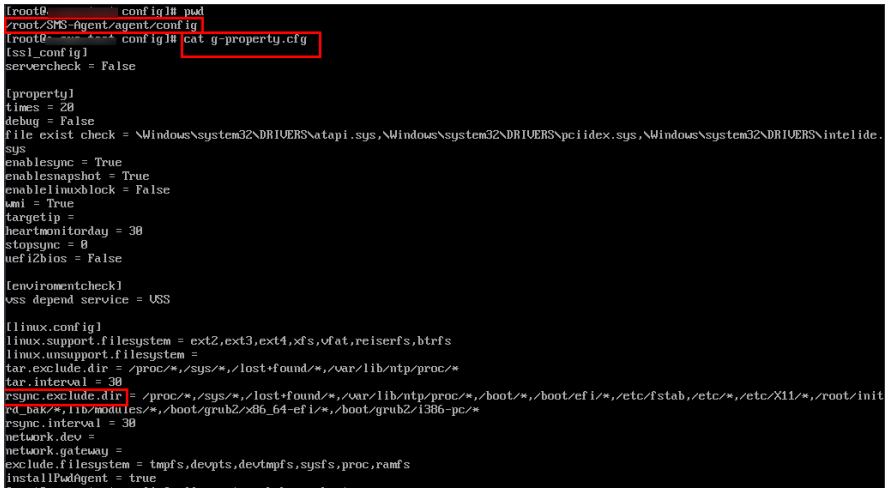
4.1.27 Will an Incremental Synchronization Overwrite the Existing Data on a Launched Target Server?

After a target server is launched when the migration is complete, new data will be written to target server disks as the services run. If you perform an incremental synchronization, the existing data on the target server disks will be overwritten by the data in corresponding directories on the source server, except for directories excluded by the **rsync.exclude.dir** parameter in the **/SMS-Agent/agent/config/g-property.cfg** file and the partitions that are not migrated.

Back up data on the target server before performing incremental synchronizations.

CAUTION

You are not advised to delete the original value of **rsync.exclude.dir**.



4.1.28 How Do I Create a Target Server that Meets the SMS Requirements?

When you use SMS to migrate a server, you can prepare a target server on the cloud platform to receive data from your source server.

SMS supports migration to ECSs, DeHs, and DeCs.

Target Server Environment Requirements

1. A target server must run the same type of OS as the source server. Otherwise, there will be a server name conflict or other problems.
2. A target server running Windows must have at least 2 GB of memory.
3. A target server must use the same type of firmware as the source server. Otherwise, the system will warn you the firmware type of the target server is different from that of the source server, or the firmware type of the source server is unknown. For details, see **How Do I Check the Firmware Type of a Source Server?**

4. Target Server Disk Requirements
   - A target server must have at least as many disks as the source server. Otherwise, the error "Insufficient disks on the Target Server" will be reported. In such a case, see **How Do I Resolve Error "Some disks on the target server are smaller than those on the source server. Select another target server" When I Configure the Target Server?**
   - Each target server disk must be at least as large as the paired source server disk, or the migration cannot continue.

     In such a case, see **How Do I Resolve Error "Some disks on the target server are smaller than those on the source server. Select another target server" When I Configure the Target Server?**
5. The required ports are enabled in a security group the target server belongs to.
   - Windows: TCP ports 8899, 8900, and 22
   - Linux: TCP port 22 for file-level migration, and ports 8900 and 22 for block-level migration

> **CAUTION**
>
> - For security purposes, these ports are only opened to the source server.
> - The firewall of the target server must allow traffic to these ports.

How to Create a Target Server

Method 1: Create a target server before the migration

Create an ECS, DeH, or DeC that meet the requirements in advance.

When you configure the target server on the SMS console, set **Server** to **Use existing** and select the server you created.

Method 2: Create a target server during the migration

When you configure the target server on the SMS console, set **Server** to **Create during migration**.

For details, see Step 7 in **Configuring the Target Server**.

4.1.29 Can SMS Migrate Self-built Databases, Big Data Services, or Websites Deployed on a Source Server?

SMS lifts and shifts entire servers. All self-built services deployed on source servers, such as databases, big data services, and websites, can be migrated.

After the migration is complete, you need to pause these services but do not stop the source server before performing the final service cutover. Otherwise, the target server may take a long time to launch, data will be inconsistent between the source and target servers, or the services may not be started on the target server.

4.1.30 Can the AK/SK of a Federated User (Virtual IAM User) Be Used for Authentication During the SMS-Agent Startup?

SMS does not support authentication using AKs/SKs of federated users (virtual users) during the SMS-Agent startup.

4.1.31 How Do I Synchronize Files in Specific Directories After a Linux File-Level Migration Is Complete?

After a Linux file-level migration is complete, you can choose which incremental service data to be synchronized from the source server to the target server. To do so, see **In a Linux File-Level Migration, How Do I Exclude Directories from Migration and Synchronization?**.

4.1.32 Will the Migration Be Affected If the SSH Service Does Not Use Default Port 22 on the Source Server?

The migration will not be affected, regardless of what OS the source server runs.

4.1.33 How Do I Obtain the SMS Domain Name?

Scenarios

When starting the Agent, you need to enter the SMS domain name of the region to which you are migrating to obtain the latest configuration files.

Procedure

Step 1 Log in to the management console.

Step 2 In the upper left corner of the page, select the region you are migrating to.

Step 3 Click **Service List**. Under **Migration**, click **Server Migration Service**.

Step 4 In the navigation pane on the left, choose **Agents**.

Step 5 Obtain the SMS domain name you need.

----End

4.1.34 How Many Resources Will Be Used for a Linux Block-Level Migration?

Memory Usage (of Data Cache)

There are six data cache nodes configured by the Agent on a source server. The default size of a single cache node is 4 MB.

- Minimum memory occupied by data cache: 6 x 1 MB = 6 MB
- Default memory occupied by data cache: 6 x 4 MB = 24 MB
- Maximum memory occupied by data cache: 6 x 8 MB = 48 MB

CPU Usage

The details about the CPU usage during a Linux block-level migration are as follows.

Number of CPUs	CPU Usage (%) Before the Agent Starts (n)	Default Compression Threads Configured by the Agent	CPU Usage After the Agent Starts
1	-	0. Data compression is disabled by default.	< n + 10%
2	n ≥ 50%	0. Data compression is disabled by default.	< n + 10%
2	n < 50%	1	< n + 50%
4	n ≥ 75%	0. Data compression is disabled by default.	< n + 4%
4	50% ≤ = n ≤ 75%	1	< n + 25%
4	25% ≤ n < 50%	2	< n + 50%
4	n < 25%	3	< n + 75%
8	n ≥ 87%	0. Data compression is disabled by default.	< n + 3%
8	75% ≤ n < 87%	1	< n + 13%
8	62% ≤ n < 75%	2	< n + 25%
8	n < 62%	3	< n + 38%
16	n ≥ 93%	0. Data compression is disabled by default.	< n + 1%
16	87% ≤ n < 93%	1	< n + 6%
16	82% ≤ n < 87%	2	< n + 13%
16	n < 82%	3	< n + 17%
≥ 32	-	3	< n + 10%

- If data compression is enabled, the formula for calculating the CPU usage after the Agent starts is as follows:

$$CPU\ usage < (n + \frac{p \times 100}{c})\%$$

in which, **c** indicates the number of CPUs, **p** indicates the number of compression threads, and **n** indicates the CPU usage before the Agent starts.

- If data compression is disabled, the Agent occupies less than 10% of memory. The formula for calculating the CPU usage is as follows:

$$CPU\ usage < (n+10)\%$$

By default, data compression is enabled for Linux block migrations. To disable this function, see **How Do I Disable Data Compression When the CPU Usage Is Too High During a Linux Block-level Migration?**

4.1.35 How Do I Disable Data Compression When the CPU Usage Is Too High During a Linux Block-Level Migration?

By default, data compression is enabled for Linux block-level migrations. The number of compression threads is configured based on the resource usage of the source server. The default value is the number of idle CPUs, and the maximum value is 3. Data compression may cause high CPU usage. In this case, you can disable this function in the **SMS-Agent/agent/config/g-property.cfg** file.

Go to the SMS-Agent installation directory and run the following command:

```
cd ./agent/config && vi g-property.cfg
```

```
[linux.config]
linux.support.filesystem = ext2,ext3,ext4,xfs,vfat,btrfs
linux.unsupport.filesystem =
tar.exclude.dir = /proc/*,/sys/*,/lost+found/*,/var/lib/ntp/proc/*
tar.interval = 30
rsync.exclude.dir = /proc/*,/sys/*,/lost+found/*,/tmp/_MEI*,/var/lib/ntp/proc/*,/boot/*,/boot/efi/*,/etc/fstab,/etc/*,/
rsync.interval = 30
network.dev =
network.gateway =
network.macaddr =
network.ipaddr =
installPwdAgent = true
fstab.tmp_filesystem = tmpfs,devpts,devtmpfs,sysfs,proc,ramfs
fstab.ignore_mount_path =
fstab.keep_mount_path =
show_vol_progress = True
inode_used_limit = 2000000
block.compress.thread.num =
block.node.cache.size.MB =
block.need.compress = True
```

Configure the following parameters.

- **block.compress.thread.num**: The number of compression threads. The value must be an integer ranging from 1 to 3. Generally, the value is automatically set by the Agent based on the source server conditions. You can change it manually.
- **block.node.cache.size.MB**: The size of a single data cache node. There are six cache nodes configured on the source server by the Agent. The value must be an integer ranging from 1 to 8. The default value is 4.
- **block.need.compress**: controls whether to compress data during transmission. The value can be **True** or **False**. If you do not want to compress data during transmission, set this parameter to **False**.

CAUTION

Data compression occupies a large amount of CPU resources. When you configure this function, you need to consider the actual resource usage of the source server to prevent services on it from being affected. For details about the default resource usage, see **Resource Usage Description for Linux Block-Level Migrations**.

4.1.36 Do I Need to Activate My Windows OS and Paid Software After the Migration?

SMS migrates an entire server. After you use SMS to migrate a source server running Windows, you need to activate Windows and other paid software on the target server. SMS cannot help you activate Windows and other paid software. You need to contact the Windows OS provider and software providers to activate them.

4.1.37 How Do I Set the Number of Concurrent Processes for Linux File-Level Migrations?

Overview

You can set the maximum number of processes that the SMS-Agent can start concurrently (1 to 4) when migrating and synchronizing files of a Linux source server. However, the number of processes that can actually be started depends on how well the source server performs and how many disks and partitions the source server has.

CAUTION

- Enabling concurrency consumes source server resources, especially disk I/O, bandwidth, and CPU resources. To prevent the services on the source server from being affected, before enabling this function, you can evaluate the impacts on source services or **How Do I Set Resource Limits for SMS-Agent During a Linux Server Migration?**.
- If the migration bandwidth from the source server to the target server is less than 300 Mbit/s, you are not advised to enable this function.

Calculating the Maximum Number of Concurrent Processes

The formula is:

Max. concurrent processes = Min. (Disks, Bandwidth/Disk I/O performance, 4)

where

Disks is the number of disks to be migrated on the source server.

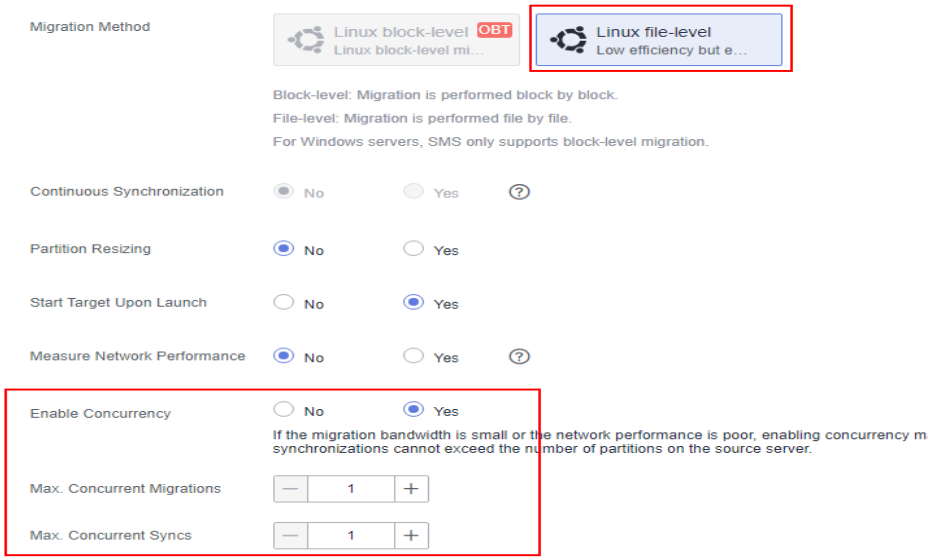
Network bandwidth is the network bandwidth between the source server and the target server. You can calculate the bandwidth by referring to **How Do I Test the Network Between the Source and Target Servers Using iPerf?**

Disk read or write performance is either the average disk read performance of the source server or the average disk write performance of the target server, whichever is smaller.

Assume that the migration involves four disks, the network bandwidth is 1,000 Mbit/s, the average read performance of the source server is 500 Mbit/s, the average write performance of the target server is 300 Mbit/s. In this example, we need to divide the network bandwidth by the average write performance of the target server (1,000 Mbit/s / 300 Mbit/s ≈ 3). That makes the three values for the formula, respectively, 4, 3 and 4, which means there can be 3 concurrent processes for this migration.

Setting the Maximum Number of Concurrent Processes

On the **Configure Basic Settings** page, set **Migration Method** to **Linux file-level** and **Enable Concurrency** to **Yes**, and specify **Max. Concurrent Migrations** and **Max. Concurrent Syncs**.



4.1.38 Which Directories Are Not Synchronized by Default During Incremental Synchronization on a Linux Server?

When incremental data synchronization is performed after full replication is complete on a Linux server, data will not be synchronized for the following directories related to host configurations:

```
/proc/*,
/sys/*,
/lost+found/*,
/tmp/_MEI*,
/var/lib/ntp/proc/*,
/boot/*,
/boot/efi/*,
/etc/fstab,
```

```
/etc/*,
/etc/X11/*,
/root/initrd_bak/*,
/lib/modules/*,
/boot/grub2/x86_64-efi/*,
/boot/grub2/i386-pc/*
```

Reasons

After the first full migration of a Linux server, some parameter settings in the preceding directories on the target server are modified to make the target server compatible with the cloud platform and ensure that the target server can start properly. During incremental synchronization, to ensure that the parameter settings in these directories on the target server are not overwritten or modified by the source data, the data in these directories on the source server is not synchronized by default.

Important Notes

If there is service data in the preceding directories, you need to manually synchronize the incremental service data to the target server.

4.1.39 How Do I Verify Data Consistency Between the Source and Target Servers?

SMS consistency verification allows you to verify data consistency before and after the migration. You can enable this function when you start an incremental synchronization.

Precautions

- Before enabling this function, you are advised to stop services (and databases if any) on the source server. If they are not stopped, data on the source server keeps changing, which will affect the consistency.

  NOTE

  It is normal for some directories on the source and target servers to have slight differences. For instance, there are directories on the source server where data is always changing, such as the directory where SMS-Agent was installed and the **/var/log** directory where stores system logs.

- The time required for consistency verification depends on the number and size of files to be verified. If consistency verification takes a long time during the final incremental synchronization, the time required for service cutover will also increase. Evaluate the impact on your services.
- Consistency verification occupies significant source disk I/O resources. Evaluate the potential impacts on your source services.

Constraints

- Consistency verification does not apply to migration scenarios where disks or partitions are adjusted. In this case, directories and paths on the source and target servers are not perfectly mapped to each other.
- It is not applicable to verification of cross-file system files or shared folders.

- To ensure your services can run normally on the source server, a maximum of 100,000 files can be verified in a single directory.
- To prevent excessive memory usage, only files whose paths do not exceed 1024 bytes are verified.

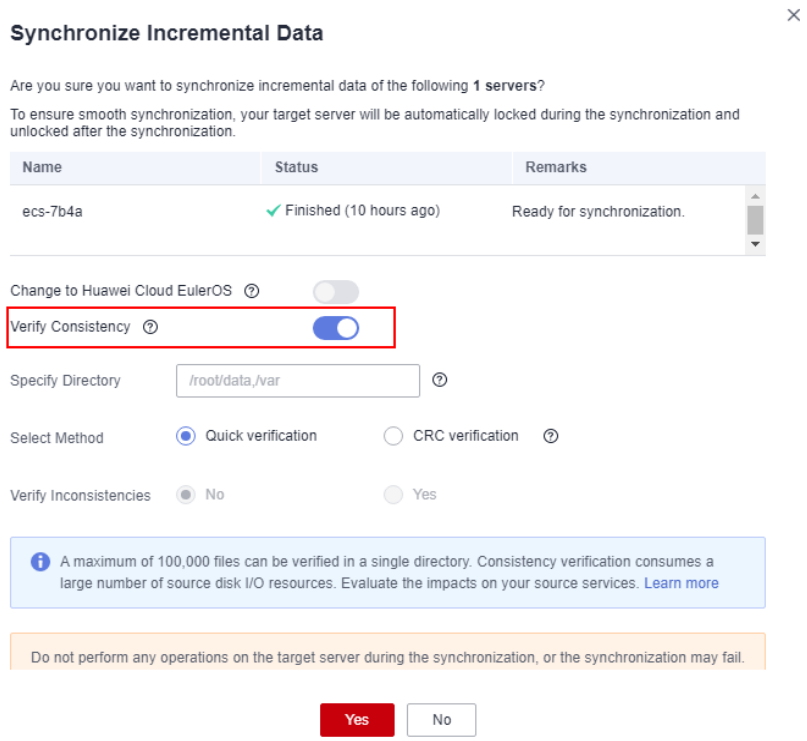
Enabling Consistency Verification

Step 1 Open the **Sync Incremental Data** dialog box by referring to section **Synchronizing Incremental Data**.

Step 2 Enable **Verify Consistency** and correctly enter the directories for which data consistency is to be verified. If the entered directories are incorrect or empty, 0 will be displayed for these directories in the verification results.

NOTICE

- The larger the amount of data to be verified, the longer the consistency verification goes on. You are advised to verify only key directories.
- The following directories will be excluded from consistency verification by default:
  - **/**, **/etc**, **/dev**, **/sys**, **/usr**, **/boot**, and **/run** in Linux
  - Root directories of partitions in Windows, for example, **C:** and **D:**.



Step 3 Select a verification method.

- Quick verification: compares the file size and last modification time.

- CRC verification: compares CRC64 checksums. This method scans file content in binary mode, which occupies a large amount of disk I/O resources and takes a long time but is more accurate.

Step 4 (Optional) Enable **Verify Inconsistencies** to verify files that were verified to be inconsistent in the previous verification. This option can only be enabled after at least one consistency verification is complete.

Step 5 Click **Yes** to synchronize incremental data and verify consistency. After the synchronization and verification are complete, you can view the verification results by referring to **Viewing Verification Results**.

----End

Disabling Consistency Verification

If you want to disable consistency verification after the incremental synchronization starts, perform the following steps:

Step 1 Choose **More** > **Pause** in the **Operation** column to pause the synchronization task.

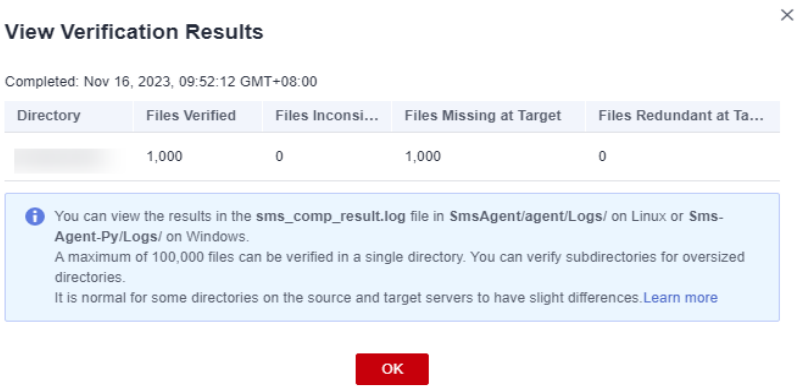
Step 2 Click **Start** in the **Operation** column.

Step 3 In the displayed dialog box, disable **Verify Consistency** and click **Yes**.

----End

Viewing Verification Results

To view the data consistency verification results, choose **More** > **View Verification Results** in the **Operation** column.



If 0 is displayed in the **Files Verified** column, it means the specified directory could not be found or is empty.

All files verified to be inconsistent are recorded in the log file **sms_cmp_result.log** in the SMS-Agent installation directory (***/SmsAgent/agent/Logs/** on Linux and **C://SMS-Agent-Py*/Logs** on Windows) on the source server.

Verification Time Estimation

The following table lists the verification time tested on servers where only the migration process runs but is for reference only.

OS	Specifications	Disk Performance	Verification Time (per 100 GB)
Windows	2 vCPUs and 4 GB of memory	5,000 IOPS/150 MB/s	About 17 minutes
Linux	2 vCPUs and 4 GB of memory	5,000 IOPS/150 MB/s	About 13 minutes

4.2 OS Compatibility and Migration Restrictions

4.2.1 What Source Server OSs Are Supported by SMS and Are There Any Restrictions on Using SMS?

For details about the source server OSs supported by SMS, see **Supported Windows OSs**, **Table 4-5**.

If you need to migrate a source server whose OS is not supported by SMS, use any of the following methods:

- Use Image Management Service (IMS) to create an image for the source system disk from an external image file.
- Use a public image from IMS to create ECSs and deploy server applications on the newly created ECSs. With this method, there is actually no server migration involved.

Supported Source Server OSs

Table 4-4 Supported Windows OSs

OS	Bit	UEFI	Remarks
Windows Server 2008	64	No	Windows Server 2008 and Windows Server 2008 R2 fail to boot in UEFI mode.
Windows Server 2008 R2	64	No	
Windows Server 2012	64	Yes	N/A

OS	Bit	UEFI	Remarks
Windows Server 2012 R2	64	Yes	
Windows Server 2016	64	Yes	
Windows Server 2019	64	Yes	
Windows 7	64	No	
Windows 8.1	64	No	
Windows 10	64	Yes	

Table 4-5 Linux OSs supported by file-level migration

OS	Version	Bit	UEFI Support	Remarks
Red Hat	Red Hat Enterprise Linux 6.0 (Only KVM servers are supported.)	64	No	-
	Red Hat Enterprise Linux 6.1/6.2/6.3/6.4/6.5/6.7/6.8/6.9/6.10	64	No	
	Red Hat Enterprise Linux 7.0	64	No	
	Red Hat Enterprise Linux 7.1/7.2/7.3/7.4/7.5/7.6/7.7/7.8/7.9	64	Yes	
	Red Hat Enterprise Linux 8.0/8.1/8.2/8.3/8.4/8.5/8.6	64	Yes	
	Red Hat Enterprise Linux 9.0	64	Yes	
CentOS	CentOS 6.0 (Only KVM servers are supported.)	64	No	-
	CentOS 6.1/6.2/6.3/6.4/6.5/6.6/6.7/6.8/6.9/6.10	64	No	
	CentOS 7.0	64	No	
	CentOS 7.1/7.2/7.3/7.4/7.5/7.6/7.7/7.8/7.9	64	Yes	
	CentOS 8.0/8.1/8.2/8.3/8.4/8.5	64	Yes	

OS	Version	Bit	UEFI Support	Remarks
	CentOS Stream 8	64	Yes	This distribution will be identified as CentOS 8.0. This does not affect the migration.
	CentOS Stream 9	64	Yes	This distribution will be identified as CentOS 9.0. This does not affect the migration.
Oracle	Oracle Linux 6.0/6.1/6.2/6.3/6.4/6.5/6.6/6.7/6.8/6.9/6.10	64	No	-
	Oracle Linux 7.0	64	No	
	Oracle Linux 7.1/7.2/7.3/7.4/7.5/7.6/7.7/7.8/7.9	64	Yes	
	Oracle Linux 8.0/8.1/8.2/8.3/8.4/8.5	64	Yes	
SUSE	SUSE Linux Enterprise Server 11 SP3	64	No	-
	SUSE Linux Enterprise Server 11 SP4	64	Yes	
	SUSE Linux Enterprise Server 12 SP0	64	Yes	Btrfs file systems on this distribution cannot be migrated.
	SUSE Linux Enterprise Server 12 SP1/SP2/SP3/SP4/SP5	64	Yes	-
	SUSE Linux Enterprise Server 15 SP0/SP1/SP2/SP3	64	Yes	
	SUSE Linux Enterprise Server 15 SP4	64	No	
Ubuntu	Ubuntu Server 12.04	64	No	-
	Ubuntu Server 14.04	64	Yes	
	Ubuntu Server 16.04	64	Yes	

OS	Version	Bit	UEFI Support	Remarks
	Ubuntu Server 18.04	64	Yes	
	Ubuntu Server 19.04	64	Yes	
	Ubuntu Server 20.04	64	Yes	
	Ubuntu Server 22.04	64	Yes	
Debian	Debian GNU/Linux 6.0.10	64	No	-
	Debian GNU/Linux 7.11.0	64	No	
	Debian GNU/Linux 8.0/8.1/8.2/8.3/8.4/8.5/8.6/8.7/8.8/8.9/8.10/8.11	64	No	
	Debian GNU/Linux 9.0/9.1/9.2/9.3/9.4/9.5/9.6/9.7/9.8/9.9/9.10/9.11/9.12/9.13	64	No	
	Debian GNU/Linux 10.0/10.1/10.2/10.3/10.4/10.5/10.6/10.7/10.8/10.9/10.10/10.11/10.12/10.13	64	Yes	
	Debian GNU/Linux 11.0/11.1/11.2	64	Yes	
	Debian GNU/Linux 11.3/11.4/11.5/11.7	64	No	
Fedora	Fedora 23/24/25/26/27/28/29/33/34/35/36/37	64	No	-
EulerOS	EulerOS 2.2.0	64	No	-
	EulerOS 2.3.0	64	No	
	EulerOS 2.5.0	64	No	
Amazon Linux	Amazon Linux 2.0	64	No	-
	Amazon Linux 2018.3	64	No	
Alibaba Cloud Linux	Alibaba Cloud Linux 3.2104	64	No	-
	Alibaba Cloud Linux 3.2104 (Quick Start)	64	No	
	Alibaba Cloud Linux 2.1903 LTS	64	No	
	Alibaba Cloud Linux 2.1903 LTS (Quick Start)	64	No	
	Alibaba Cloud Linux 2.1903 LTS (CCSP 2.0 Level 3)	64	No	

OS	Version	Bit	UEFI Support	Remarks
Tencent OS	TencentOS Server 2.4	64	No	-
	TencentOS Server 2.4 (TK4)	64	No	
	TencentOS Server 3.1 (TK4)	64	No	
Kylin	Kylin Linux Advanced Server V10 (Sword)	64	No	-
OpenEuler	OpenEuler 20.03	64	No	-
	OpenEuler 21.09	64	No	
OpenSUSE	OpenSUSE 15.1/15.2/51.3/15.4	64	No	-
Rocky Linux	Rocky Linux 8.5/8.6/8.7/9.0/9.1	64	No	-

- Migration constraints and limitations

  Table 4-6 Constraints and limitations on source servers

Source Server Type	Description
OS	• Table 4-4 • Table 4-5 • A server running multiple OSs cannot be migrated.
Available disk space	• Windows: at least 320 MB of available space on a partition not smaller than 600 MB; at least 40 MB of available space on a partition smaller than 600 MB • Linux: at least 200 MB of available space on the root partition
File system	• Windows: Only NTFS partitions are supported. • Linux: Only ext2, ext3, ext4, VFAT, XFS, and Btrfs file systems are supported.
Shared file system	Only files on the local disk can be migrated. Files in the shared file systems, such as NFS and CIFS file systems, cannot be migrated.
Encrypted file	OSs that contain protected folders and encrypted volumes cannot be migrated.

Source Server Type	Description
Database and Active Directory Domain (AD DS) application	SMS does not support AD and multi-node database migration.
Applications bound to hardware	SMS does not support the migration of OSs that contain applications bound to hardware.
Dynamic disk	In Windows, dynamic disks are migrated as basic disks. After the migration is complete, the target ECS will not have dynamic disks.
Servers added to a domain	If you want to migrate a server added to a domain, after the migration is complete, the target ECS must be added to that domain.

4.2.2 What Are the Important Statements of SMS?

- Source server data collection

  After the Agent is installed and configured on the source server, it automatically reports the source server information to SMS for verification. The collected information is used only for migration feasibility check. If you use SMS, you agree that SMS collects the information.

- License invalidity

  After OSs, applications, and files on source servers are migrated to target servers, the SIDs and MAC addresses of the servers will change. This means that some OS or application licenses may become invalid. SMS is not responsible for this type of issue. You can use the license server on the cloud platform to obtain new licenses and update or obtain application licenses at your own expense.

- Target server disk formatting

  During a migration, disks on the target server are formatted and re-partitioned based on the source disk settings. Any existing data on the target server will be lost. Before the migration, make sure you have backed up any data on the target server that you need to save and ensure that the disks can be formatted. SMS is not responsible for any data losses incurred.

- If your target servers on the cloud platform cannot be started after the migration is complete, the cloud platform can provide technical support to help you solve the problem, but does not promise that the all possible problems can be resolved.

  There are many possible reasons that a target server may be unable to start, for example:

  – The source server cannot be restarted.
  – The source server has a non-standard OS configuration.
  – The source server has drivers or software that are incompatible with the cloud platform.

- SMS modifies the system configuration of a target server to make it compatible with the cloud platform. SMS can ensure data consistency before

and after the migration but cannot ensure that your services run properly after the migration. You need to modify related service configurations thereafter.

4.2.3 How Many Servers Can I Migrate Concurrently Using SMS?

You can migrate a maximum of 1,000 servers concurrently. If you need to migrate more than 1,000 servers, delete the migrated servers from the server list in a timely manner so that other servers can continue to be migrated.

4.2.4 How Do I Resolve the Error "Inconsistent firmware type. Source: UEFI, Target: BIOS" When I Create a Migration Task?

Symptom

If you select a target server with the UEFI boot mode when you create a migration task for a source server with the UEFI boot mode, you will receive this message.

Possible Causes

The target server uses a different boot mode from the source server. In this case, the target server cannot be launched after the migration. You must select a target server created from the image with the UEFI boot mode.

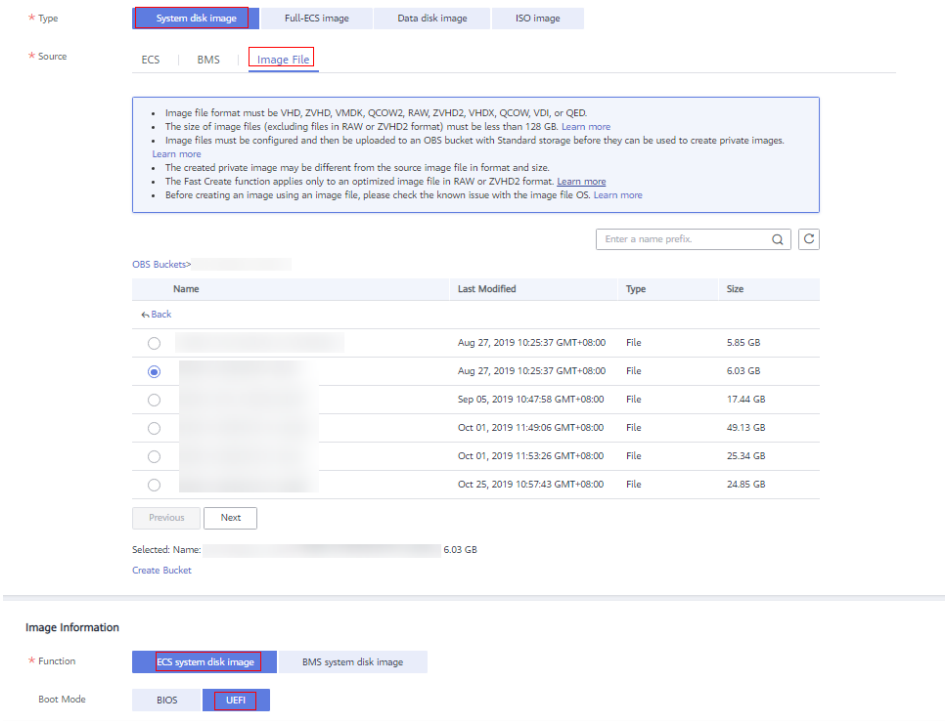
Solution Using the Management Console

Step 1 Download an image file as needed. If such an image file has been stored in your OBS bucket, go to **Step 3**.

Step 2 Upload the image file to your OBS bucket.

Step 3 Use the image file to create a private image on the IMS console.

1. Select **Image File** for **Source** and select the uploaded image file.
2. Set **Boot Mode** to **UEFI**.



Step 4 Use the private image to create an ECS.

----End

4.2.5 How Do I Resolve Error "Incompatible file system of the source server"?

Symptom

After the migration feasibility check is complete, you receive error message "SMS.6509 Incompatible file system of the source server."

Possible Causes

There are unsupported file systems on the source server.

Solution

Currently, SMS supports Ext2, Ext3, Ext4, XFS, VFAT, and Btrfs files systems for Linux.

For unsupported file systems such as ReiserFS, you can copy files to other file systems, uninstall the unsupported file systems, and then perform the migration.

If this is not possible on the source server, you can:

- Use IMS to create a system disk image for the source server from an external image file and use the image to create a server on the cloud platform.
- Use a public image on IMS to create a target server and deploy your applications on the target server.

4.2.6 How Do I Resolve Error "Insufficient permissions. Add corresponding fine-grained permissions"?

Symptom

During the migration, you received error message "SMS.0204 Insufficient permissions. Cause: xxx. Please add corresponding fine-grained permissions."

Possible Causes

Using SMS requires that you have permissions for ECS, VPC, IMS and EVS, or the migration will fail.

Solutions

Obtain all required fine-grained permissions and try again. For details, see **Creating a User and Granting Permissions**.

4.2.7 How Do Resolve the Error "Source server lacks driver files"?

Symptom

After you started the Agent, the source server did not pass the migration feasibility check, and you received error message "SMS.6511 Source server lacks driver files" on the SMS console.

Possible Causes

After the Agent is started, it will verify the driver files on the source server. If any necessary driver files are missing, the preceding error is reported.

The following files are necessary:

* C:\Windows\system32\DRIVERS\atapi.sys

* C:\Windows\system32\DRIVERS\pciidex.sys

* C:\Windows\system32\DRIVERS\intelide.sys

Solution

Check whether the preceding files are there on the source server. If any of them are missing, use the driver repair tool to repair the files or copy the files from another server.

4.2.8 How Do I Resolve Error "VSS not installed on the source server"?

Symptom

After the Agent was started, a source server running Windows did not pass the migration feasibility check, and error message "SMS.6533 VSS not installed on the source server" was displayed on the SMS console.

Possible Causes

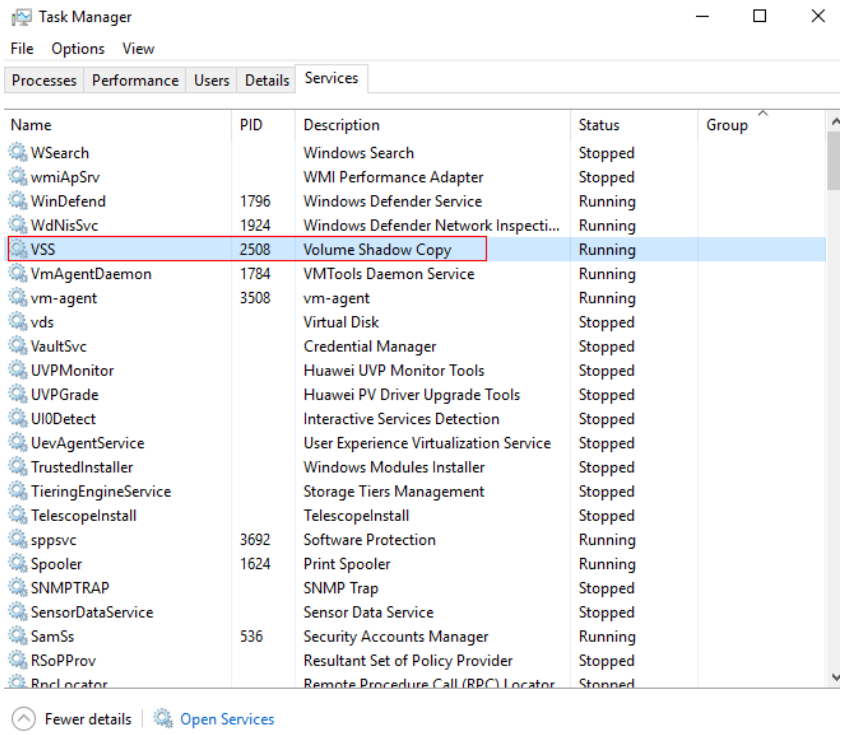
The possible causes are as follows:

1. The VSS service is not installed on the source server.
2. The VSS service is disabled on the source server.

Solution

1. Open the **Task Manager** and check whether the VSS service is there. If it is, go to **2**. If it is not, go to **3**.

   Figure 4-1 Checking whether the VSS service exists

2. Modify the configuration file to disable I/O monitoring.

   If you do not need to synchronize data, you can modify the configuration file to disable I/O monitoring.

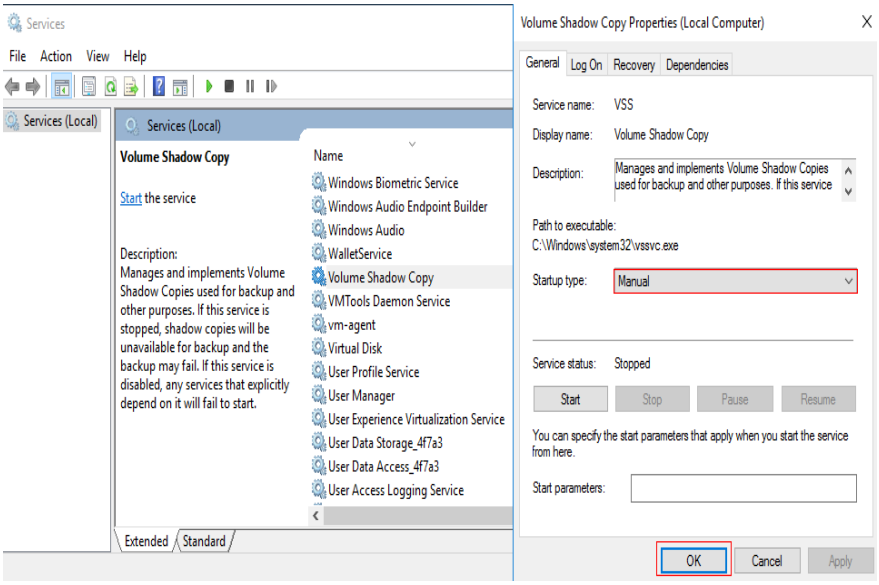
   In the Agent installation directory **config**, change the value of **enablesync** to **False** in the **g-property.cfg** file, and then restart the Agent.

Figure 4-2 Modifying the **g-property.cfg** file

```
[ssl_config]
servercheck = False

[property]
times = 1000
file_exist_check = C:\Windows\system32\DRIVERS\atapi.sys,C:\Windows\system32\DR
enablesync = False
smsuserid = 73d9354840688452fbd7dff67432f4084
wmi = True
targetip =
heartmonitorday = 7
stopsync = 0

[enviromentcheck]
vss depend service = RPCSS,EventSystem,SENS,VSS,SWPRV,COMSYSAPP

[linux.config]
linux.support.filesystem = ext2,ext3,ext4,vfat,xfs,reiserfs
linux.unsupport.filesystem = btrfs
tar.exclude.dir = /proc/*,/sys/*,/lost+found/*,/var/lib/ntp/proc/*
tar.check.schedule.times = 4
tar.interval = 30
```

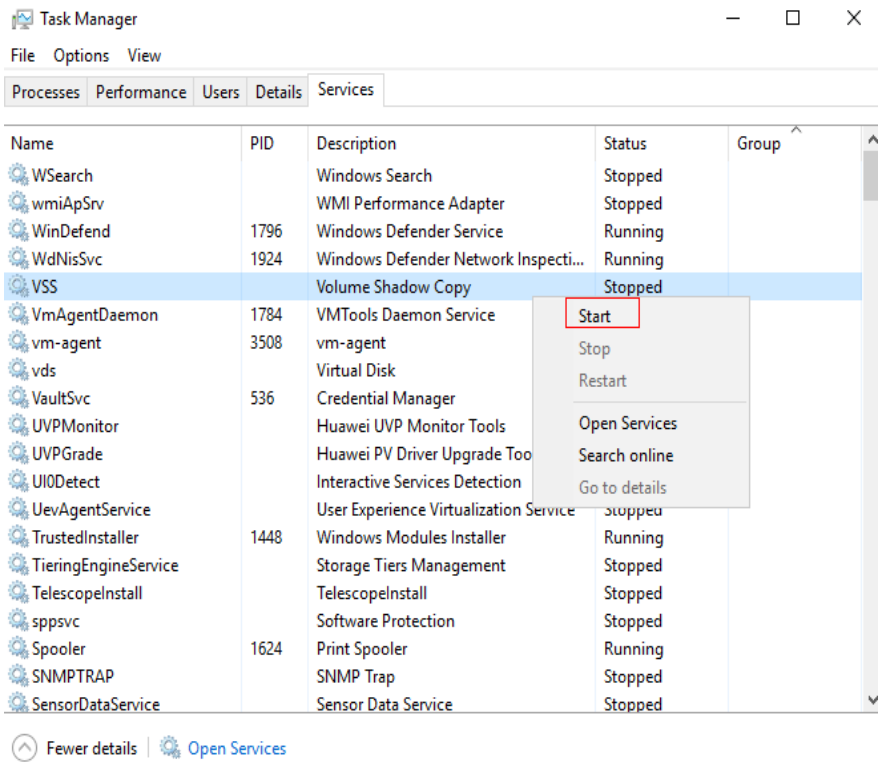
3. Check VSS status. If its status is **Stopped**, right-click the service and choose **Open Services** from the shortcut menu. Locate and right-click **Volume Shadow Copy**, and choose **Properties** from the shortcut menu. On the displayed **Volume Shadow Copy Properties** window, change the **Startup type** to **Manual**. Click **OK**.

Figure 4-3 Changing the startup mode of VSS



4. Go back to the **Task Manager** window, locate and right-click **VSS**, and choose **Start** from the shortcut menu.

Figure 4-4 Starting VSS



5. Log in to the SMS console, locate the migration task, and in the **Operation** column, choose **More** > **Delete**.

   After the deletion is complete, restart the Agent.

4.2.9 How Do I Check the Firmware Type of a Source Server?

After the Agent is installed and started on the source server, click the source server name on the **Servers** page of the SMS console. On the **Basic Information** tab page, in the **Source Server** area, you can view the firmware type of the source server.

4.2.10 Why Can't I Save the Migration Configuration as a Template?

Symptom

After you completed the migration configuration, you clicked **Save as Template** to save the configuration as a template for future use, but the message "Failed to save the configuration" was displayed.

Possible Causes

The image used to create the target server is a private image and has been deleted. SMS cannot identify the information about this private image. As a result, the migration configuration fails to be saved as a template.

Solution

Go to the ECS console and reinstall or change the OS of the target server.

If you want to change the firmware type of the target server from BIOS to UEFI, create a private image by following the instructions provided in How Do I Resolve Error "Inconsistent firmware type. Source: UEFI, Target: BIOS" When I Create a Migration Task?

4.2.11 How Do I Set Resource Limits for SMS-Agent During a Linux Server Migration?

You can set limits for CPU usage, memory usage, and disk throughput for SMS-Agent on the source server.

Prerequisites

Cgroups has been installed and enabled on the source server.

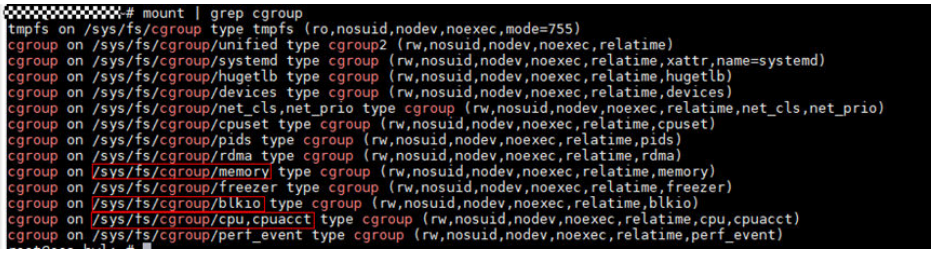
To check if it has been installed, run the following command on the source server:

```
mount | grep cgroup
```

If the following cgroups V1 or V2 mounting information is displayed, cgroups is enabled on the source server. Otherwise, it is not.

Before setting resource limits on the SMS console, evaluate whether installing or enabling cgroups will affect services on the source server. If source services are related to cgroups, submit a service ticket to contact SMS migration experts in advance to check whether the SMS resource limits conflict with the source services.

- cgroups V1

  The example output shows that the following three mount points were attached to the CPU, memory, and disk I/O controllers, respectively.

  - /sys/fs/cgroup/CPU,CPUacct
  - /sys/fs/cgroup/memory
  - /sys/fs/cgroup/blkio

- cgroup V2

  cgroup V2 is mounted on /sys/fs/cgroup. Unlike cgroup V1, cgroup V2 has no mount points attached to specific resources.

Procedure

Step 1 Log in to the SMS console.

Step 2 In the navigation pane on the left, choose **Servers**.

Step 3 In the server list, locate the server to be migrated, and click **Configure** in the **Target** column.

Step 4 Set resource limits based on the following table.

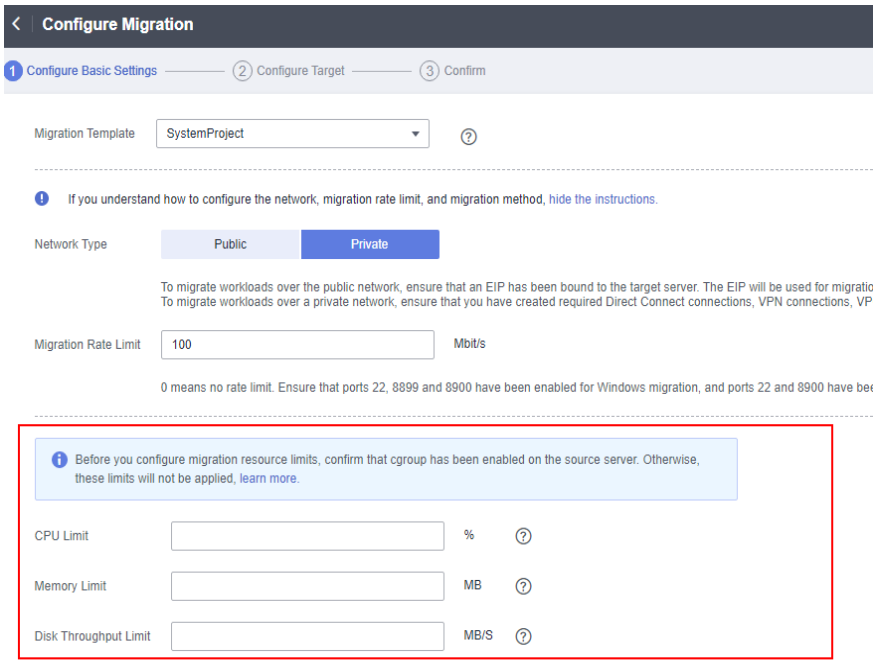


Table 4-7 Parameters

Parameter	Description	Precaution
CPU Limit	Controls the maximum of CPU resources to be used by the SMS-Agent on the source server. • If this parameter is left blank, the CPU usage of SMS-Agent is not limited. • 1% ≤ CPU limit (integer) ≤ 100% • To ensure a smooth migration, allocate at least 0.2 CPUs to SMS-Agent. Formula: CPU limit (%) = Maximum number of CPUs allowed for SMS-Agent/Total number of CPUs x 100% For example: If the source server has 4 CPUs, and you want to allocate 0.5 CPUs for SMS-Agent, you can enter 13% (0.5/4x100%).	• The CPU limit and disk throughput limit may affect the migration speed. • When the resource limits are applied, a folder named **sms_mig_cgroup** will be created in **/sys/fs/cgroup** on the source server, and parameters for configured limits are created here.
Memory Limit	Controls the maximum of memory to be used by SMS-Agent. If the configured limit is reached, SMS-Agent will be stopped or ended. • If this parameter is left blank, the memory usage of SMS-Agent is not limited. • 200 MB ≤ Memory Limit ≤ 1,000 MB • To ensure a successful migration, allocate at least 200 MB of memory to SMS-Agent.	

Parameter	Description	Precaution
Disk Throughput Limit	Controls the maximum disk throughput to be used by SMS-Agent. After the limit is set, the disk read/write speed during the migration will not exceed the limit. • If this parameter is left blank, the disk throughput of SMS-Agent is not limited. • 10 MB/s ≤ Disk Throughput Limit ≤1000 MB/s • To ensure a successful migration, allocate at least 10 MB/s of disk throughput to SMS-Agent.	

----End

Modifying Resource Limits

You can modify resource limits for tasks in which the target servers have been configured but the migration is not started, those have been paused, and those in which the full migration is complete and incremental synchronizations are to be performed. After locating such a task, choose **More** > **Set Migration Limits** in the **Operation** column to reset the resource limits.

Viewing Resource Usage

You can run the **top** and **iotop** commands on the source server to view the resource usage during the migration. It is normal for the resource usage of SMS-Agent to slightly exceed the configured limits.

4.3 Migration Network

4.3.1 How Do I Set Up a Secure Migration Network for Using SMS?

Scenarios

To use SMS, you need to install the Agent on each source server to be migrated. During the migration, each source server must continuously communicate with SMS and the paired target server.

Connecting Source Servers to API Gateway

- The Agent installed on source servers must communicate with services IAM, ECS, EVS, IMS, VPC, SMS, OBS, and DNS during the migration. You must ensure that the Agent can call the APIs of these services in the region where you are migrating to. You can view the domain names of these services in supported regions in the **SMS-Agent/config/cloud-region.json** file.
- If the DNS server addresses are not configured on the source server, you need to map each endpoint to its IP address in the local hosts file (**/etc/hosts for Linux**). The IP addresses can be obtained by pinging the endpoints.

Connecting Source Servers to Target Servers

- If you want to migrate over the Internet, you need to an EIP for the target server.
- If you want to migrate over a private network, you need to a Direct Connect or VPN connection from your source environment to the cloud platform.

Opening Required Ports on Target Servers

- For Windows target servers, open inbound ports 8899, 8900, and 22 in their security groups. For Linux target servers, open inbound ports 8900 and 22 in their security groups.
- If a network ACL is configured for the subnet you are migrating to, you also need to open the required inbound ports in the ACL.

  For details, see **How Do I Configure Security Group Rules for Target Servers?**

4.3.2 How Do I Prepare a Target Server Before the Migration?

If you want to use an existing ECS as the target server, make the following preparations:

Step 1 Make sure the ECS meets the requirements described in **How Do I Select a Target Server?**.

Step 2 Connect the source server to the ECS using an EIP or VPN or Direct Connect connection.

Step 3 Correctly configure the security group associated with the ECS.

If the ECS runs Windows, enable TCP ports 8899, 8900, and 22. If the target ECS runs Linux, enable TCP port 22 for a file-level migration or ports 8900 and 22 for a block-level migration.

For details about how to configure security group rules, see **How Do I Configure Security Group Rules for Target Servers?**

CAUTION

If you indeed use the ECS as the target server, do not perform any operations on the ECS during the migration, such as stopping or restarting the ECS, attaching or detaching a disk, or changing the password, or the migration will fail.

----End

4.3.3 How Do I Configure Security Group Rules for Target Servers?

1. Log in to the management console.
2. Click in the upper left corner and select the desired region and project.
3. Under **Compute**, click **Elastic Cloud Server**.
4. In the ECS list, click the name of the target ECS.

   The page providing details about the ECS is displayed.
5. Click the **Security Groups** tab and view security group rules.
6. Click **Modify Security Group Rule**.

   The **Summary** page of the security group is displayed.
7. On the **Inbound Rules** tab, click **Add Rule** to configure an inbound rule.
   - If the ECS runs Windows, configure three rules: one for port 8899, one for port 8900, and one for port 22. For each, set the protocol to **TCP**.
   - If the ECS runs Linux, configure two rules: one for port 8900 and one for port 22. For each, set the protocol to **TCP**.
   - For all the rules, set **Source** to the IP address range containing the IP addresses that you want to allow to access the ECS over the Internet.

     NOTE

     If you retain the default value **0.0.0.0/0** for **Source IP Address**, it indicates that all IP addresses can access the ECS.
8. Click **OK**.

4.3.4 How Do I Resolve the Error "Failed to establish an SSH connection with the target ECS"?

Symptom

The migration task failed, and you received the error message "sms.3802 Failed to establish an SSH connection with the target ECS."

Problem Analysis

During a Linux file-level migration, an SSH connection is established between the source server and target server for data transmission. If the SSH connection is not set up, the preceding error message is displayed. You are advised to review the following parts to locate the cause of the SSH connection failure.

- Checking Whether the Target Server Is Stopped
- Checking Whether Port 22 Is Allowed in the Security Group of the Target Server and the Source IP Address Is Configured Correctly
- Checking Whether the Source Server Can Connect to the Target Server
- Checking Whether the SSH Client Is Installed on the Source Server
- Checking Whether the VPC or IP Address of the Target ECS Is Changed During the Migration
- Checking the Firewall Settings of the Source Server

Checking Whether the Target Server Is Stopped

Step 1 Log in to the management console.

Step 2 Under **Compute**, click **Elastic Cloud Server**. Locate the target ECS and view its status. If the ECS is stopped, choose **More** > **Start** in the **Operation** column.

----End

Checking Whether Port 22 Is Allowed in the Security Group of the Target Server and the Source IP Address Is Configured Correctly

Step 1 Log in to the management console.

Step 2 Under **Compute**, click **Elastic Cloud Server**. In the ECS list, click the name of the target ECS.

Step 3 On the ECS details page, click the **Security Groups** tab. Check whether port 22 is allowed and whether the source IP address is specified correctly.

If port 22 is not allowed in the inbound direction, add an inbound rule for port 22. If such an inbound rule exists but the source IP address is not 0.0.0.0/0 or the IP address of the source server, change the source IP address to 0.0.0.0/0.

For details, see **How Do I Configure Security Group Rules for Target Servers?**

----End

Checking Whether the Source Server Can Connect to the Target Server

Step 1 Log in to the source server.

Step 2 Run **telnet** *Target server IP address Port in the error message*. If the port is not reachable, check the configurations of the DNS servers, firewalls, security groups, and local networks of the source and target servers.

----End

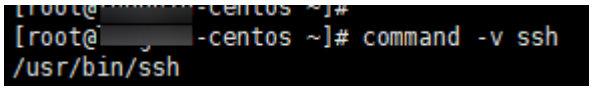
Checking Whether the SSH Client Is Installed on the Source Server

Step 1 Log in to the source server as user **root**.

Step 2 Check whether the SSH client is installed.

If the SSH path shown in the following figure is not returned, install the SSH client.

command -v ssh



----End

Checking Whether the VPC or IP Address of the Target ECS Is Changed During the Migration

If the VPC or IP address of the target server is changed during the migration, change it back to the original VPC or IP address. Otherwise, you will need to repeat the migration.

Checking the Firewall Settings of the Source Server

Check whether the outbound traffic is blocked by the source server firewall. If yes, permit the traffic and continue the migration.

4.3.5 How Do I Fix the Error "Failed to connect to the target ECS. Check whether its IP address is reachable and confirm that port XX is enabled"?

Symptom

The target server could not be accessed, and either of the following messages was displayed:

- Failed to connect to the target ECS. Check whether its IP address is reachable and confirm that port 8900 is enabled.
- Failed to connect to the target ECS. Check whether its IP address is reachable and confirm that port 8899 is enabled.

Problem Analysis

For a Windows migration, ports 8899 and 8900 must be enabled on the target server for communicating with SMS and the source server. If communications cannot be established, this error occurs. You can locate the fault by:

- **Checking Whether the Source Server Can Connect to the Target Server**
- **Checking Whether the Peagent on the Target Server Is Running Properly**
- **Checking Whether Ports 8899 and 8900 Are Enabled in the Security Group of the Target Server**
- **Checking Whether Ports 8899 and 8900 Are Allowed in the Network ACL of the Subnet Where the Target Server Is Running**

Checking Whether the Source Server Can Connect to the Target Server

Step 1 Log in to the source server.

Step 2 Run **telnet** *Target server IP address Port in the error message*. If the port is not reachable, check the configurations of the DNS servers, firewalls, security groups, and local networks of the source and target servers.

----End

Checking Whether the Peagent on the Target Server Is Running Properly

After confirming the network is normal, forcibly restart the target server. Wait for about 3 minutes and start the migration again.

Checking Whether Ports 8899 and 8900 Are Enabled in the Security Group of the Target Server

Step 1 Log in to the management console.

Step 2 Under **Compute**, click **Elastic Cloud Server**. In the ECS list, click the name of the target ECS.

Step 3 On the ECS details page, click the **Security Groups** tab. Check whether ports 8899 and 8900 are opened and the source IP address is specified correctly.

If port 8899 or 8900 is not opened, add an inbound rule for the port. If such rules exist but the source IP address is not 0.0.0.0/0 or the IP address of the source server, change it to 0.0.0.0/0.

For detailed instructions, see **How Do I Configure Security Group Rules for Target Servers?**

----End

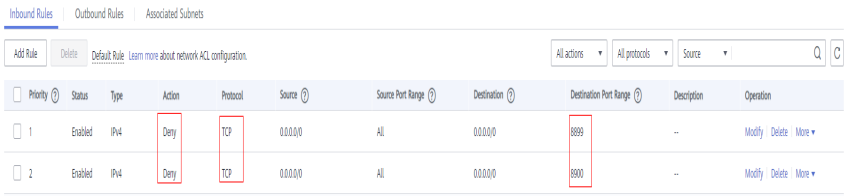
Checking Whether Ports 8899 and 8900 Are Allowed in the Network ACL of the Subnet Where the Target Server Is Running

Step 1 Log in to the management console.

Step 2 Check whether the subnet of the target server is associated with a network ACL.

If a network ACL has been associated and there are inbound rules configured for ports 8899 and 8900, change the action to **Allow**.

For details, see "Modifying a Network ACL Rule" in *Virtual Private Cloud User Guide*.



----End

4.3.6 How Do I Fix a Connection Failure Between the Source Server and API Gateway Due to a Busy Network?

Symptom

The Agent could not be started, and either of the following message was displayed:

Linux: Failed to start sms agent! Please check the network connection with below commands!

Windows: Network busy. The source server failed to connect to API Gateway.

Possible Causes

The source server cannot communicate with IAM or SMS over the Internet. In this case, check the source network.

Solution

Step 1 Log in to the source server.

Step 2 Confirm that you can access IAM and SMS on the source server.

curl -v {*Endpoint of IAM***}:443**

curl -v {*Endpoint of IAM***}:443**

If curl fails to be executed, for example, due to a network timeout, the source server cannot access the IAM or SMS management console.

Step 3 Check whether the source server can access the Internet. If it cannot, locate the fault by checking the configurations of the DNS server, firewall, security group, and local network of the source server. For details, see **Why Cannot an EIP Be Pinged?** Then rectify the fault and restart the Agent.

Step 4 If a proxy server is used, check whether the proxy server is running properly.

Common proxy problems are incorrect login credentials, network disconnections, and firewall or various software restrictions.

----End

4.3.7 How Do I Restore the Connection Between the Agent and SMS?

Symptom

The server migration was in the **Disconnected** status, so most operations could not be performed.

Possible Causes

- The Agent on the source server is not running.

- The Agent is disconnected from SMS. This can happen if no operations are performed on the Agent for a long time (30 days by default, but this can be changed using the **heartmonitorday** parameter in the **config/g-property.cfg** file).
- The network connection between the source server and the Agent is abnormal.
- The SMS-Agent-Py3 process exits. This can happen if you have been logged out of or have exited from the source server automatically.

Windows Server 2019/2016/2012 and Windows 10/8.1

Step 1 Log in to the source server, search for the Agent icon in the lower right corner, and check whether the Agent is running properly.

- If the Agent has exited, restart the Agent.

  CAUTION

  Do not log out or exit the source server, or the SMS-Agent-Py3 will also exit.

  If you have such requirements, use SMS-Agent-Py2 to perform the migration again.

- If the Agent is running properly, go to **Step 2**.

Step 2 On the **Agent** operation page, check whether the **Start** button can be clicked.

- If it can, the Agent has proactively disconnected from SMS. Click **Start** to reconnect to it.
- If it cannot, go to **Step 3**.

Step 3 Run the **curl -v {***endpoint of SMS***}/v3/sources** command to check the connection between the source server and the SMS API.

- If the connection is unavailable, check whether the DNS and firewall of the source server are correctly configured.
- If the connection is available and data is being transmitted, check whether the outbound bandwidth of the source server is lower than 10 Mbit/s. If it is, the data transmission may be using up all the bandwidth, which can cause the connection between the Agent and SMS to time out. In this case, increase the outbound bandwidth of the source server to more than 10 Mbit/s, and then continue the migration.

Step 4 Wait for about a minute and log in to the management console.

Step 5 Click **Service List**. Under **Migration**, click **Server Migration Service**.

The SMS console is displayed.

Step 6 In the navigation pane on the left, choose **Servers**.

In the **Status** column, view the connection status of the source server.

----End

Windows Server 2008 and Windows 7

Step 1 Log in to the source server and check whether the **SMSAgentDeploy.exe** process is running properly.

- If the process does not exist, restart the Agent and go to **Step 2**.

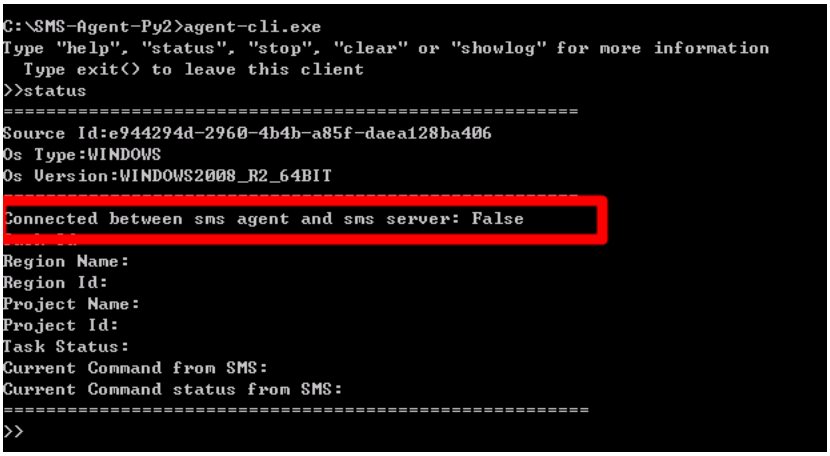
  WARNING

  If you restart the Agent, you need to repeat the migration.

- If the process exists, go to **Step 2**.

Step 2 Go to the SMS-Agent installation directory, run **agent-cli.exe**, and then run **status** to check the Agent connection status.

- If the status is **True**, go to **Step 4**.
- If the status is **False**, the Agent has proactively disconnected from SMS. In this case, go to **Step 3**.



Step 3 Enter **connect** to reconnect the source server to SMS.

If in the command output, the value of **Connected between sms agent and sms server** is **True**, the connection between the source server and SMS has been restored.

Step 4 Run the **curl -v {*endpoint of SMS*}/v3/sources** command to check the connection between the source server and the SMS API.

- If the connection is unavailable, check whether the DNS and firewall of the source server are correctly configured.
- If the connection is available and data is being transmitted, check whether the outbound bandwidth of the source server is lower than 10 Mbit/s. If it is, the data transmission may be using up all the bandwidth, which can cause the connection between the Agent and SMS to time out. In this case, increase the outbound bandwidth of the source server to more than 10 Mbit/s, and then continue the migration.

Step 5 Wait for about a minute and log in to the management console.

Step 6 Click **Service List**. Under **Migration**, click **Server Migration Service**.

The SMS console is displayed.

Step 7 In the navigation pane on the left, choose **Servers**.

In the **Status** column, view the connection status of the source server.

----End

Linux

Step 1 Use PuTTY or another SSH client to log in to the source server.

Step 2 Run **ps -ef | grep -v grep | grep linuxmain** to check whether the Agent is running properly.

- If the **linuxmain** process is not running, restart the Agent.
- If the **linuxmain** process is running, go to **Step 3**.

```
[root@          ~]# ps -ef | grep -v grep | grep linuxmain
root     30634     1  0 Aug28 ?        00:00:00 ./linuxmain 1
root     30636 30634  0 Aug28 ?        00:00:14 ./linuxmain 1
```

Step 3 Run **./agent-cli.sh** in the SMS-Agent directory to go to **agent-cli**, and run **status** to check the Agent connection status.

- If the status is **True**, go to **Step 5**.
- If the status is **False**, the Agent has proactively disconnected from SMS. In this case, go to **Step 4**.

Step 4 Enter **connect** to reconnect the source server to SMS.

If in the command output, the value of **Connected between sms agent and sms server** is **True**, the connection between the source server and SMS has been restored.

Figure 4-5 Reconnecting the source server to SMS

```
>>connect
==========================================================
Source Id:
Os Type:LINUX
Os Version:CENTOS_7_4_64BIT
==========================================================
Connected between sms agent and sms server: True
Task Id:
Region Name:
Region Id:
Project Name:
Project Id:
Task Status:NA
Current Command from SMS:
Current Command status from SMS:
```

Step 5 Run the **curl -v {*endpoint of SMS*}/v3/sources** command to check the connection between the source server and the SMS API.

- If the connection is unavailable, check whether the DNS and firewall of the source server are correctly configured.
- If the connection is available and data is being transmitted, check whether the outbound bandwidth of the source server is lower than 10 Mbit/s. If it is, the data transmission may be using up all the bandwidth, which can cause the

connection between the Agent and SMS to time out. In this case, increase the outbound bandwidth of the source server to more than 10 Mbit/s, and then continue the migration.

Step 6 Wait for about a minute and log in to the management console.

Step 7 Click **Service List**. Under **Migration**, click **Server Migration Service**.

The SMS console is displayed.

Step 8 In the navigation pane on the left, choose **Servers**.

In the **Status** column, view the connection status of the source server.

----End

4.3.8 Why the Migration Progress Is Suspended or Slow?

Symptom

During the migration, the progress bar changes slowly or does not change.

Possible Causes

This problem may be caused by multiple factors, such as the network bandwidth, the number of small files on the source server, and the difference comparison during incremental synchronization.

Procedure

- Check the bandwidths of the source and target servers. Allocate sufficient bandwidth for the migration process without affecting services.
- Check whether there are a large number of small files on the source server. If there are, delete as many unnecessary files as possible.
- During a Linux file-level migration, if the synchronization progress stays at 6% for a long time, please wait patiently. The migration process is comparing and synchronizing the differences between the source and target servers.
- Check the migration status on the SMS console. If it is **Connected**, wait patiently. If it is **Disconnected**, see **How Do I Restore the Connection Between the Agent and SMS?**

4.3.9 Does a Source Server Have to Connect to the Internet?

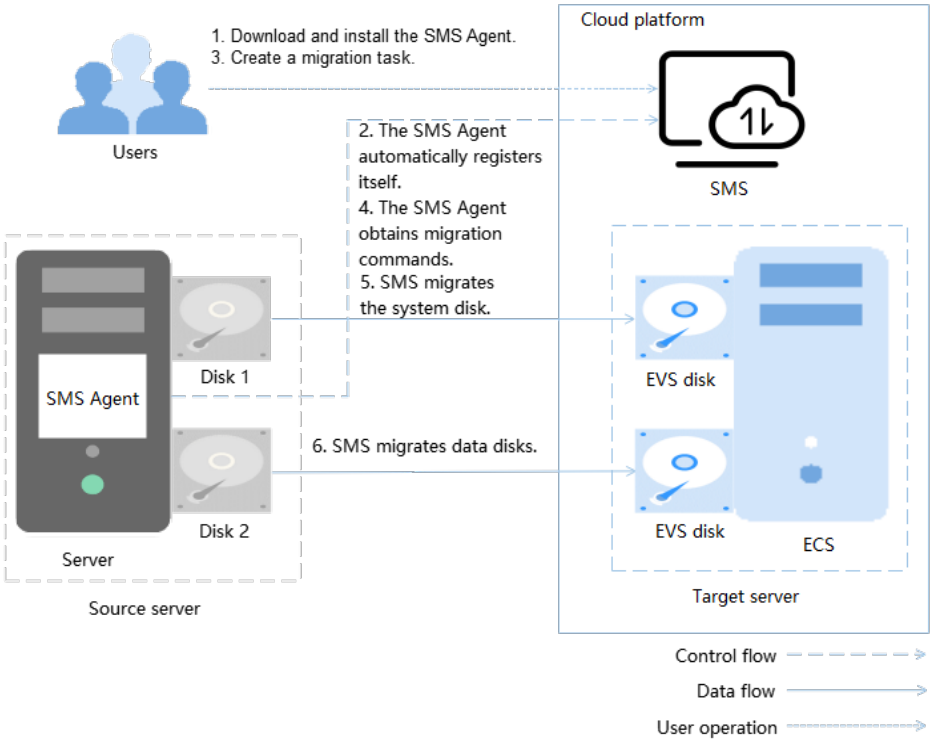
The source server must connect to the Internet. It does not matter if it connects to the target server through a Direct Connect connection, VPN connection, or VPC peering connection. In the following figure, the Direct Connect connection, VPN connection, or VPC peering connection between the source and target servers is used only for data flow transmission. The control flow between the source server and SMS needs to be transmitted over the Internet.

NOTE

If the source server cannot access the Internet, you can configure a proxy server for the source server.

The following figure shows how SMS works.

Figure 4-6 How SMS works



- Control flow: the interaction process between the source server and SMS

  The interactions include:

  Step 2: The Agent registers itself with SMS and reports the information about the source server to SMS. Then, SMS evaluates migration feasibility of the source server.

  Step 4: The Agent receives and executes the migration commands sent by SMS.
- Data flow: the process of migrating data on the source server

  The data migration includes:

  Step 5: SMS migrates the system disk of the source server.

  Step 6: SMS migrates the data disks of the source server.

4.3.10 Can I Release or Change the Target Server EIP During the Migration?

No.

If you choose to migrate over the Internet, the Agent on the source server records the target server EIP when the migration starts, and uses that EIP for data transmission during the migration. Releasing or changing the EIP during the migration will cause the migration to fail.

You can release or modify the EIP only after the migration is complete and no data synchronization is required.

4.3.11 How Do I Resolve the Error "SMS.0302 Failed to resolve domain name xxx"?

Symptom

When you started your migration task, you received the error message "SMS.0302 Failed to resolve domain name %s."

Possible Causes

The source server can communicate with SMS for migration only after all dependent domain names are resolved successfully. If any domain name fails to be resolved, this error message is displayed.

The possible causes of domain name resolution failures are as follows:

1. The local network is abnormal.
2. The record set is abnormal.
3. The record set has been modified or cached by a local DNS server.

Solutions

For details about the cause analysis and solution, see the Domain Name Service (DNS) Documentation.

4.3.12 How Do I Resolve the Error "SMS.0303 Unable to access domain name xxx"?

Symptom

When you started your migration task, you received the error message "SMS.0303 Unable to access domain name xxx."

Possible Causes

For a successful migration, the source server must access all dependent domain names. If any domain name fails to be connected, this error message is displayed.

The possible causes are as follows:

1. The network is abnormal, for example, the connection times out or the network is disconnected or inaccessible.
2. The access is blocked by the firewall.
3. Security alarms are generated on the source server, or the source server EIP is unbound or frozen.
4. The access is blocked by the security group of the source server.

Solutions

1. Ping another domain name.

- If the ping operation succeeds, the network is normal.
- If the ping operation fails, the network is abnormal. Check the local network.

2. Check the firewall settings of the source server.

   If the access is blocked, allow the access and continue the migration.

3. Check whether security alarms are generated on the source server, or the source server EIP is unbound or frozen.
   - If the EIP has been unbound, you can bind it back or use a private network for migration.
   - If the EIP is frozen, contact ECS or EIP technical support.
4. Check whether the required outbound ports are allowed in the security group of the source server.
   - If there are no outbound rules for the protocols and ports shown in **Figure 4-7**, add rules for them.
   - If there are outbound rules for the ports but **Action** is set to **Deny**, change the actions to **Allow**.
   - If there are outbound rules for allowing the ports but the destination IP addresses are not **0.0.0.0/0**, change them to **0.0.0.0/0**.

Figure 4-7 Outbound rules

4.4 Migration Duration

4.4.1 How Long Does a Migration Take?

1. Pre-migration evaluation

   Test the TCP speed from a source server to the target server. For details, see **How Do I Test the Network Between the Source and Target Servers Using iPerf?**

   $$T = \frac{C \times 1000 \times 8}{S \times 3600 \times U}$$

   where
   - *T*: the migration time, in hours
   - *C*: the total data volume of the source server, in GB
   - *S*: the TCP speed (in Mbit/s) from the source server to the target ECS, that is, the TCP speed obtained in **4.b**
   - *U*: the network usage, which is related to network quality (jitter, delay, and packet loss). The value is usually between 50% and 80%.

For example, if the total data volume of the source server is 100 GB, the TCP speed tested by iPerf is 100 Mbit/s, and the network usage is 70%, the migration time is calculated as follows:

Migration time T = 100 GB x 1000 x 8 / 100 Mbit/s / 3600 / 70% ≈ 3.17 hours

You can refer to **Table 4-8** to view the migration time of source servers of different data volumes and TCP speeds assuming that the network usage U is 70%.

Table 4-8 Migration time

Total Data Volume on Source Server (C) (GB)	TCP Speed (S) (Mbit/s)	Migration Time (T) (Hour) NOTE For migration time T, if the unit is hour, two digits are retained after the decimal point. If the unit is min, the value is an integer.
10 GB	0.5 Mbit/s	SMS is not recommended.
	1 Mbit/s	SMS is not recommended.
	5 Mbit/s	6.35 hours
	10 Mbit/s	3.17 hours
	100 Mbit/s	0.32 hours (about 19 minutes)
	500 Mbit/s	0.06 hours (about 4 minutes)
	1,000 Mbit/s	0.03 hours (about 2 minutes)
30 GB	0.5 Mbit/s	SMS is not recommended.
	1 Mbit/s	SMS is not recommended.
	5 Mbit/s	19.04 hours
	10 Mbit/s	9.52 hours
	100 Mbit/s	0.95 hours (about 57 minutes)
	500 Mbit/s	0.19 hours (about 11 minutes)
	1,000 Mbit/s	0.10 hours (about 6 minutes)
50 GB	0.5 Mbit/s	SMS is not recommended.
	1 Mbit/s	SMS is not recommended.
	5 Mbit/s	SMS is not recommended.
	10 Mbit/s	15.87 hours
	100 Mbit/s	1.59 hours
	500 Mbit/s	0.32 hours (about 19 minutes)
	1,000 Mbit/s	0.16 hours (about 10 minutes)

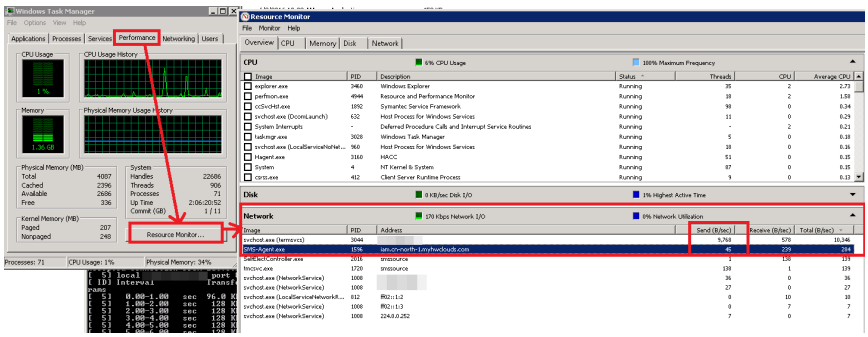
Total Data Volume on Source Server (C) (GB)	TCP Speed (S) (Mbit/s)	Migration Time (T) (Hour) NOTE For migration time T, if the unit is hour, two digits are retained after the decimal point. If the unit is min, the value is an integer.
100 GB	0.5 Mbit/s	SMS is not recommended.
	1 Mbit/s	
	5 Mbit/s	
	10 Mbit/s	
	100 Mbit/s	3.17 hours
	500 Mbit/s	0.63 hours (about 38 minutes)
	1,000 Mbit/s	0.32 hours (about 19 minutes)
500 GB	0.5 Mbit/s	SMS is not recommended.
	1 Mbit/s	
	5 Mbit/s	
	10 Mbit/s	
	100 Mbit/s	15.87 hours
	500 Mbit/s	3.17 hours
	1,000 Mbit/s	1.59 hours
1 TB	0.5 Mbit/s	SMS is not recommended.
	1 Mbit/s	
	5 Mbit/s	
	10 Mbit/s	
	100 Mbit/s	
	500 Mbit/s	6.50 hours
	1,000 Mbit/s	3.25 hours
Greater than 1 TB	N/A	SMS is not recommended.

2. Evaluation during migration (remaining time)

   $T = C \times 1000 \times 8 \times (80\% - P) / 60\% / S / 3600$

   - *T*: the time required, in hours
   - *C*: the total data volume of the source server

- *P*: the transmission progress. *P* can be viewed on the SMS console. If *P* is larger than 80%, the data transmission is complete and you do not need to evaluate the remaining time.
- *S*: the migration speed in Mbit/s. *S* cannot be tested accurately with iPerf. To obtain the accurate migration speed:
  - Windows: Choose **Windows Task Manager** > **Performance** > **Resource Monitor** to view the migration speed *S* for Windows OSs.



  - Linux: You are advised to use the sar tool or use **/proc/net/dev** to monitor the NIC speed.

Take an example where there is 100 GB to be migrated (*C*), the progress (*P*) is 70%, and the migration speed (*S*) is 100 Mbit/s. If we plug in the numbers in our formula, we get:

Migration time *T* = 100 GB x 1000 x 8 x (80% - 70%) / 60% / 100 Mbit/s / 3600 = 0.37 hours

4.4.2 How Do I View the Remaining Migration Time?

The remaining migration time depends on how much data is left to migrate and on how fast it is being migrated. Because the migration rate changes over time, the remaining time shown on the SMS management console is only an estimate. You can perform the following operations to view the remaining migration time:

Step 1 Log in to the management console.

Step 2 Click **Service List**. Under **Migration**, click **Server Migration Service**.

The SMS console is displayed.

Step 3 In the navigation pane on the left, choose **Servers**.

The server list is displayed.

Step 4 Locate the source server, hover over the icon corresponding to **Full Replication** in the **Migration Stage** > **Real-Time Status**, and view the remaining migration time.

----End

4.4.3 How Is the Migration Rate Displayed on the SMS Console Calculated?

Metrics

Table 4-9 Related metrics

Metric	Windows Block-Level	Linux File-Level	Linux Block-Level
Total data	Total used space of all partitions to be migrated. You can right-click a partition and choose **Properties** from the shortcut menu. On the **General** tab, you see details about partition usage.	Total used space of all partitions to be migrated. You can run **df -TH** to view the used and available space on each partition.	Total size of all partitions to be migrated. You can run **fdisk -lu** to view the size of all the partitions.
Migrated data	Total size of all migrated data blocks that are located in the used partition space.	Total size of all migrated files.	Total size of all migrated data blocks in the partition.
Elapsed time	Time elapsed after a migration starts.		
Remaining time	Remaining time = (Total data – Migrated data) / Migration rate		

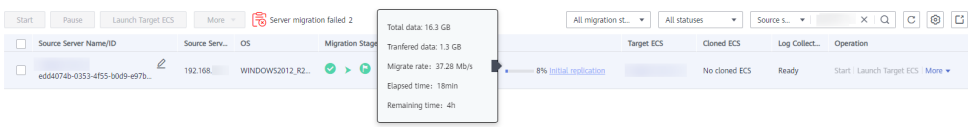
Metric	Windows Block-Level	Linux File-Level	Linux Block-Level
Migration rate	**Calculated using the amount of data migrated over the last 5 seconds**. For example, if 200 MB data was migrated over the last 5 seconds, the migration rate is 320 Mbit/s (200 MB x 8/5s). The migration rate is different from the NIC rate because the data is compressed before being transmitted through the NIC. For details, see **Windows Block-Level Migration**.	Actual migration speed, which is the NIC rate of the target server.	**Calculated using the amount of data migrated over the last 5 seconds**. For example, if 200 MB data was migrated over the last 5 seconds, the migration rate is 320 Mbit/s (200 MB x 8/5s). The migration rate is different from the NIC rate because the data is compressed before being transmitted through the NIC. For details, see **Linux Block-Level Migration**.

Windows Block-Level Migration

There are two types of Windows block-level migration rates. One is the rate displayed on the SMS console, which is the average migration rate over the last 5 seconds. The other is the actual NIC throughput for the migration process, which is less than what is displayed on the console because the data is compressed before being transmitted through the NIC

- **Migration rate displayed on the SMS console (before compression)**

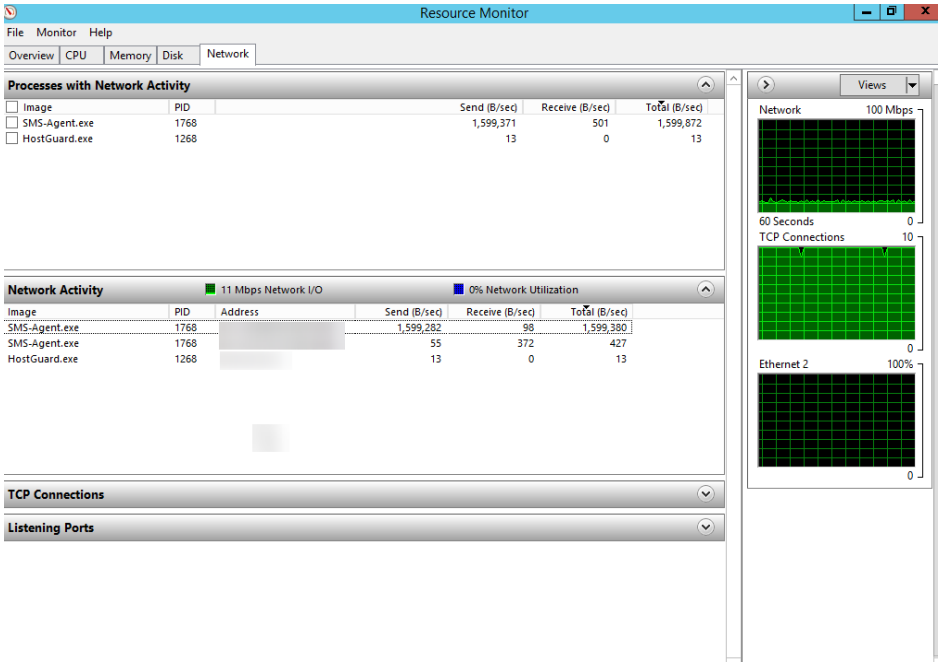
  The migration rate displayed on the console is the actual amount of data migrated per second, which is the data transmission rate before compression. This rate shown is based on the average amount of data migrated over the last 5 seconds. For example, if 200 MB of data was transmitted over the last 5 seconds, and the amount of data after compression is 50 MB, the rate displayed on the console is 320 Mbit/s (200 MB*8/5s), but the NIC throughput for the migration process is 80 Mbit/s (50 MB*8/5s).



- **Actual NIC throughput (after compression)**

  During a Windows block-level migration, the Agent compresses data before transmitting it to the target ECS. The agent on the target ECS decompresses the data and writes the data to disks. The actual NIC throughput is the

network bandwidth occupied by the migration process. You can view this rate in the task managers on the source server and target ECS. However, you can view this rate only after the target ECS is unlocked. The following uses Windows Server 2012 as an example.



CAUTION

- You can view the network bandwidth occupied by the migration process in the task manager. Use the migration rate displayed on the SMS console to estimate how long the migration will take.
- The NIC rate of the source server also includes the bandwidth occupied by applications running on the source server. A more reliable indicator is the migration rate of the migration process. The rate displayed in the task manager is the compressed data transmission rate.
- A Windows block-level migration rate is more stable because it is not affected by the number or size of files to be migrated.

Linux File-Level Migration

During a Linux file-level migration, data is not compressed, so the migration rate displayed on the console and the NIC throughput should match.

However, there is an exception. A Linux file-level migration is inefficient when transferring small files. When migrating a large number of small files, the network bandwidth cannot be fully utilized. In such a scenario, the migration rate is far lower than the available network bandwidth.

Linux Block-Level Migration

During a Linux file-level migration, data is not compressed, so the migration rate displayed on the console and the NIC throughput should match.

4.4.4 How Do I Speed Up Migration?

- Improve your network speed. You can test the network performance from the source server to the target ECS on the cloud platform. For details, see **How Do I Test the Network Between the Source and Target Servers Using iPerf?** If the network speed is less than 500 Kbit/s, check the following items:
  - If the source server is in a data center, check the bandwidth, switches, routers, security devices (such as firewalls), network lines, and network protocols between the source server and the Internet for issues. If there are any issues, contact network engineers to rectify the fault. It is recommended that the speed of the network from the source server to the cloud platform be at least 10 Mbit/s.
  - Check the outbound bandwidth of the source server and the inbound bandwidth of the target server. Increase the smaller bandwidth or both as needed. For the influence of bandwidth on migration duration, see **Table 4-8**.
  - Check that the OS settings of the source servers and target ECSs. In Windows, you can run **perfmon** to invoke Performance Monitor to monitor the network. In Linux, you are advised to use the sar tool to monitor the network and use **/proc/net/dev** to monitor the NIC speed. If the network is slow, the OS configuration may be incorrect. Note that your OS services and processes cannot limit the NIC speed.
- Delete any files you no longer need from the source server before migration.
- Check the I/O read and write performance and CPU performance of the source server. In Windows, you can run **perfmon** to invoke Performance Monitor to monitor the CPU and I/O read and write performance. In Linux, you can use **top** or **ps** to monitor the CPU, and use **iostat** or **iotop** to monitor the I/O performance. If the I/O and CPU performance of your source server is poor, you are advised to increase the I/O and CPU resources or reduce the workloads on the source server.

4.4.5 Why Does the Migration Speed Fluctuate?

During the migration, operations such as module initialization, data backup, and data clearing are performed. It is difficult to accurately estimate the duration of these operations. Speed fluctuation is a normal phenomenon.

4.4.6 How Do I Test the Network Between the Source and Target Servers Using iPerf?

Prerequisites

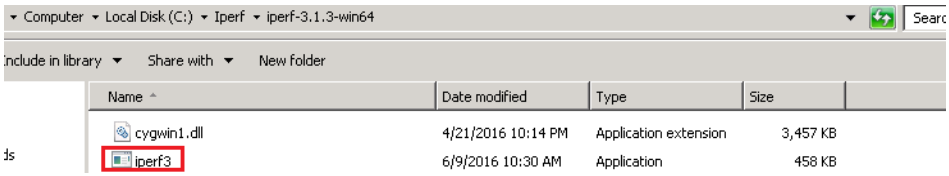
Ensure that the network between the source and target server is connected, and the port used for the iPerf test is allowed by a security group rule configured for the target server. For how to configure a security group rule, see **How Do I Configure Security Group Rules for Target Servers?**

This test must be performed before the migration, and services running on the source server need to be those with little impact on the network, or the test results will be inaccurate.

Procedure

Step 1 Download **iPerf** based on the source server OS.

Step 2 Extract the iPerf installation package into directories on the source and target servers (or another server in the same region as the target server). On a Windows server, the iPerf installation package looks like follows.



Step 3 On the target server, run iPerf in server mode using the CLI. The following uses Windows as an example.

1. Switch to the directory with the iPerf executable:

   cd /d *path*

   In this command, *path* is where you extracted iPerf on the target server in **Step 2**.

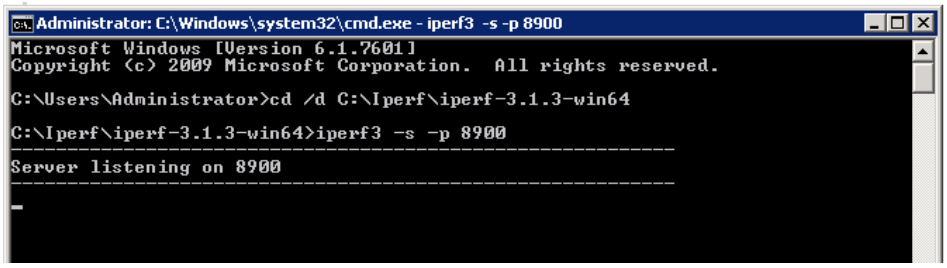
2. Run iPerf in server mode:

   iperf3 -p *port* **-s**

   In this command, *port* is the port the iperf server listens on. It is recommended that port 8900 be used for Windows and port 22 for Linux since the two ports are configured as data transmission ports. You can also use another port for testing, but ensure that the TCP or UDP port is allowed in security group rules configured for the target server.

   For details about more parameters, run the **iperf -h** command.

   Assuming that port 8900 is used for Windows, if **Server listening on 8900** is displayed in the command output, the iPerf server is running.



Step 4 On the source server, run iPerf in client mode using the CLI. Test the TCP bandwidth, UDP jitter, packet loss rate, and bandwidth. The following uses Windows as an example.

1. Switch to the directory with the iPerf executable:

   cd /d *path*

   In this command, *path* is where you extracted iPerf on the source server in **Step 2**.

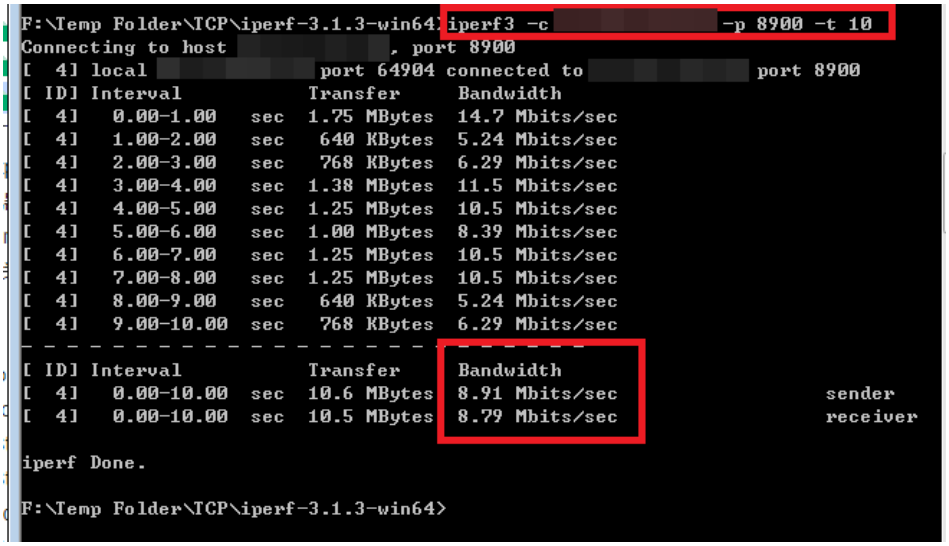
2. Test the TCP bandwidth using iPerf:

   iperf3 -c *target_IP* **-p** *port* **-t** *time*

   In the preceding command, **-c** is used to run iPerf in client mode.

- *target_IP* is the IP address of the target server (iPerf server).
- *port* is the port used for connecting to the target server, that is, the iPerf listening port 8900 in **Step 3.2**.
- *time* is the total test time. The default unit is second.

Wait for the iPerf client to connect to the iPerf server and the bandwidth test to complete, and then check the results.



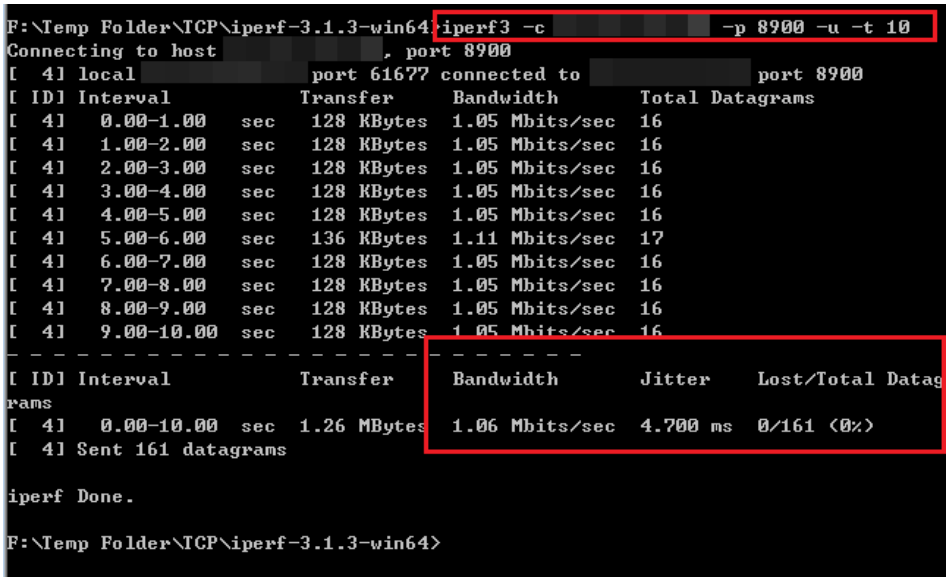
3. Test the UDP jitter, packet loss rate, and bandwidth.

   iperf3 -c *target_IP* **-p** *port* **-u -t** *time*

   -u is used to measure the UDP jitter, packet loss rate, and bandwidth.

   - *target_IP* is the IP address of the target server (iPerf server).
   - *port* is the port used for connecting to the target server, that is, the iPerf listening port 8900 in **Step 3.2**.
   - *time* is the total test time. The default unit is second.

   Wait for the iPerf client is connected to the iPerf server and the test is complete, and check the result.



4. Run the following ping command to measure the network delay:

   ping *target_iP*

   target_IP is the IP address of the target server (iPerf server).

   Ensure the ICMP packets are allowed to pass through by the security group rules of the VPC to which the target server belongs.

Step 5 View all testing options. Alternatively, you can obtain the help information about **iPerf** on its official website.

iperf3 -h

----End

4.4.7 Why Isn't the Increased Bandwidth Being Used During the Migration?

The bandwidth being used will be limited by one of the three bottlenecks:

- The newly increased bandwidth of the source server
- The inbound bandwidth of the target server.
- The migration rate limit you configured on the SMS console. For details, see **Setting the Migration Rate**.

CAUTION

As long as there is on other bottleneck, the newly increased bandwidth takes effect after 5 to 10 minutes.

4.4.8 Is the Migration Speed Determined by the Source Bandwidth or the Target Bandwidth?

The migration speed is limited by either the outbound bandwidth of the source server or the inbound bandwidth of the target server, whichever is smaller.

4.4.9 Why Does the Migration Stay in a Stage for a Long Time?

A migration may stay in the **Continuous Synchronization**, **Full Replication**, or **Target Launch** stage for a long time. For details about the stage your migration is in, see **Where Can I Find the Agent Run Logs?**

- Scenario 1: Continuous Synchronization

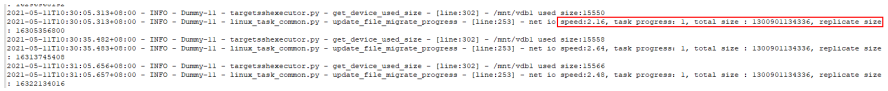
Continuous synchronization is a new feature of SMS. It automatically synchronizes incremental data from a source server to the target server. If you set **Continuous Synchronization** to **Yes** when you configure the migration settings, after the full replication is complete, the migration enters the **Continuous Synchronization** stage.

To complete the migration, you need to manually launch the target server, or the migration remains in the **Continuous Synchronization** stage.

- Scenario 2: Full Replication

During the full replication, the migration progress is suspended for a long time if the data volume is large but the migration speed is too slow. You can verify the causes by viewing the Agent run logs.

If information similar to the following is displayed, the migration is normal.



Parameter	Description
speed	The migration rate
task progress	The migration progress
total size	The amount of data to be migrated
replicate size	The amount of data migrated

NOTE

If the migration rate is not 0 and the amount of migrated data keeps increasing, the migration runs normally.

- Scenario 3: Target Launch
  - After you launch the target server, the task progress bar stays at 0% for a long time.

    After you launch the target server, the system performs an incremental data synchronization. The incremental data volume determines how much time is required for the synchronization. The synchronization progress may remain unchanged for a long time if there is too much incremental data on the source server.

    To check whether data is being synchronized, view the latest **sms_Info.log** file. If no error logs were generated during the target server launch, the migration went smoothly.
  - After you launch the target server, the task progress bar remains unchanged for a long time.

    You can pause the task and start it again. Wait for about 10 minutes and check whether the progress bar changes.

4.4.10 What Factors Affect the Migration Speed?

The following table lists the factors that may affect the migration speed and duration.

OS	Factor	Description
None	CPU or memory usage	The migration occupies some memory and CPU resources of the source server. The usage varies depending on the source conditions. Before the migration, ensure that both the CPU usage and memory usage of the source server are not higher than 75%, and the available memory is at least 520 MB.
	Network bandwidth	The network latency between the source and target servers must not be too high. The migration speed depends on the source bandwidth and the target bandwidth, whichever is smaller. For details about the network requirements, see **How Do I Set Up a Secure Migration Network for Using SMS?**
Windows	Disk fragments	SMS supports only block-level migration for Windows servers. During migration, the migration process identifies and migrates valid blocks. A large number of disk fragments will be generated on disks in daily use, which prolongs the migration duration.
Linux	• Large files • Too many small files	For a file-level Linux migration, the migration speed will be affected if • There are files larger than 2 GB. • There are a large number of small files, such as, those smaller than 20 KB.

The following table lists the factors that may affect the synchronization duration.

OS	Factor	Description
None	• Too many new data on the source server • Too many changed data on the source server	During an incremental synchronization, if a large amount of data is newly generated or changed on the source server, the synchronization takes a long time.
Windows	Too many file fragments	During a synchronization, if a large number of file fragments are generated on the source server, the synchronization takes a long time.

OS	Factor	Description
Linux	Large sparse files	During a synchronization, the system scans but does not migrate sparse files. If there are large sparse files on the source server, the synchronization takes a long time.

4.4.11 Why Is the Linux Block-Level Migration Very Slow?

Symptom

During a Linux block-level migration, you found that the actual migration rate was far lower than the bandwidth limit I have configured.

Possible Causes

The possible causes are as follows:

- A small amount of data is stored in disk blocks.
- A large number of sparse files are stored in source disks.

In a Linux block-level migration, data is compressed before being transmitted. If the disk blocks to be migrated store a small amount of data or are empty, the data compression rate is high, for example, 100 MB of data is compressed to 5 MB. In this case, the displayed migration rate will be very low. But actually, the migration is still performed quickly, and the network connection and bandwidth are normal.

4.5 Agent Installation and Startup

4.5.1 How Do I Install the Agent on Source Servers?

- To install the Agent on a Windows source server, see **Windows**.
- To install the Agent on a Linux source server, see **Linux**.

4.5.2 What Can I Do If I Fail to Download the Agent Installation File?

Step 1 Check that your computer can access the Internet. Then, run the following command in the cmd window to check whether **Address** is followed by an IP address.

```
nslookup sms-agent-bucket.obs.ae-ad-1.g42cloud.com
```

Step 2 If an IP address is displayed, check whether the domain name corresponding to the IP address is contained in the hosts file. If it is, delete the record and download the installation package again.

If the IP address is not displayed, add the following record to the hosts file, and download the package again:

{Addresses} sms-agent-bucket.obs.ae-ad-1.g42cloud.com

Example: 100.100.100.0 sms-agent-bucket.obs.ae-ad-1.g42cloud.com

NOTE

In Windows, the hosts file is stored in the **C:\Windows\System32\drivers\etc** directory and can only be edited by the super administrator. In Linux, the hosts file is stored in the **/etc** directory.

Step 3 If the download still fails after you have performed the preceding steps, you are advised to use another computer to download the package and upload it to the source server from there.

----End

4.5.3 How Do I Verify the Integrity of the Agent Installation File?

Step 1 Log in to the SMS console.

Step 2 In the navigation pane on the left, choose **Agents**. Click **SHA256 File** in the pane of the Agent you need to save the file containing the hash value to a local directory.

Step 3 Obtain the hash value of the Agent installation file you have downloaded.

- Windows Agent

  certutil -hashfile *SMS-Agent-PyN.exe* **SHA256**

  SMS-Agent-PyN.exe is the Agent installation file name.
- Linux Agent

  sha256sum SMS-Agent.tar.gz **SHA256**

Step 4 Compare the hash values obtained in **Step 2** and **Step 3**.

- If they are consistent, the Agent installation file is complete.
- If they are inconsistent, download the Agent you need again and repeat **Step 3** and **Step 4** for verification.

----End

4.5.4 Why Wasn't My Source Server Added to the SMS Console After I Configured the Agent?

After the Agent was installed and configured on the source server, the source server information was not added to the SMS console. In this case, you need to perform the following operations:

Step 1 Check whether the source server has been registered with SMS. If the source server is registered with SMS, the message "Upload success. Waiting for the SMS

instruction" will be displayed on the CLIs of Windows Agent Python 2 and Linux Agent, and the message "sms agent starts up successfully" will be displayed in the GUI of Windows Agent Python 3.

Step 2 Check whether you use the correct account to log in to the SMS console and whether the AK/SK pair of the account is entered when you start the Agent.

Step 3 If the source server has been successfully registered with SMS, and the console version matches the Agent version, but no records are displayed, wait for about a minute and refresh the page.

----End

4.5.5 How Do I Find and Modify the Agent Configuration Files?

The configuration files of the Agent are stored in the installation directory of the Agent. For details, see **SMS-Agent configuration files**.

Table 4-10 Agent configuration files

Agent configuration files	Description	Location
auth.cfg	Modify this configuration file when an HTTPS proxy server is used for migration. You do not need to modify this file when a public network is used for migration.	Windows: **C:\SMS-Agent-Py3\config** or **C:\SMS-Agent-Py2\config** Linux: **../SMS-Agent/agent/config** **NOTE** **../** indicates the directory where the Agent is stored.
cloud-region.json	You do not need to modify this file.	
g-property.cfg	It is recommended that you do not modify this main configuration file. If you need to modify this file, modify it under the guidance of professional personnel.	
disk.cfg	Modify this configuration file when you want to migrate a partition on the source server running Windows to a specified disk on the target server.	

4.5.6 Where Can I Find the Agent Run Logs?

The run logs of the Agent are stored in the **Logs** folder under the installation directory of the Agent. For details, see **Agent log files**.

Table 4-11 Agent log files

File	Location	Description
startup.log	Windows: **C:\SMS-Agent-Py3\Logs** or **C:\SMS-Agent-Py2\Logs** Linux: **../SMS-Agent/agent/Logs** **NOTE** In the preceding directory, **../** indicates the directory where the Agent is stored.	Records the Agent startup logs.
SmsAgent_Info.log		Records the Agent run logs.
SmsAgent_Error.log		Logs Agent errors.

4.5.7 Why Is My Target Server Locked During the Migration?

During the migration, operations on the target server may cause migration failures. To ensure a smooth migration, the target server will be automatically locked during the migration and unlocked after the migration. For details about how to unlock the target serer manually, see **How Do I Unlock a Target Server Manually?**

4.5.8 How Do I Unlock a Target Server Manually?

Symptom

After the migration is complete, the target server should be automatically unlocked. However, there are a number of reasons a target server may fail to be unlocked. For instance, there may be insufficient permissions or network issues. In this case, you can unlock the target server manually by performing the operations described in this section.

Possible Causes

The most typical reasons are:

1. The token is invalid or the network is faulty.
2. Account permissions are insufficient.

Solution

1. Check whether the corresponding server record still exists. If the record has not been deleted, in the **Operation** column, choose **More** > **Unlock Target Server** to unlock the target server.

If the system displays a message indicating that you do not have the permission to unlock the target server, use an account with the required permission and try again.

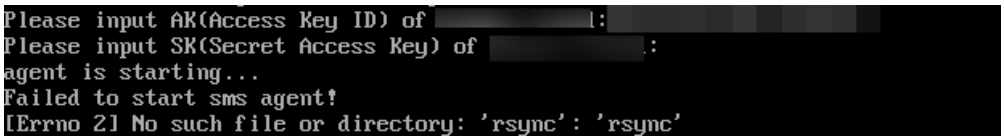
2. If the server record has been deleted, unlock the target server by referring to **Unlocking an ECS**.

4.5.9 How Do I Resolve the "No such file or directory: 'rsync':'rsync" Error When I Start the Linux Agent?

Symptom

If this error message was displayed after you entered the AK/SK pair and start the Linux Agent, rsync was not installed on the source server. You need to install rsync and restart the Agent.

Figure 4-8 Error message



Possible Causes

Linux migration depends on rsync. If rsync is not installed on the source server, the Agent cannot be started.

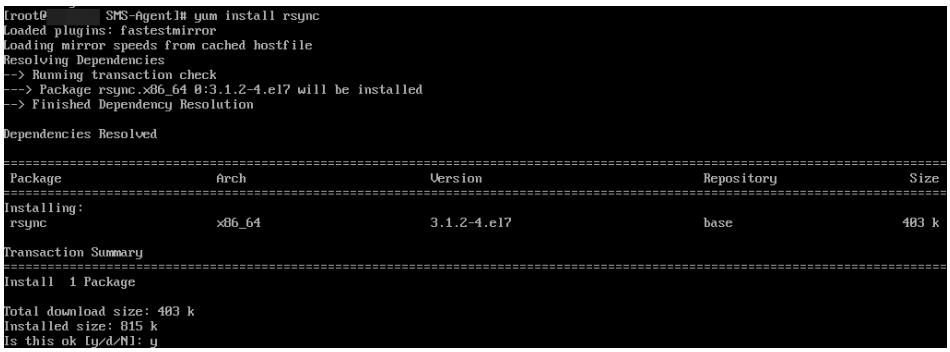
Solutions

The operations for different OSs are as follows:

CentOS and Red Hat

1. Use PuTTY or another SSH client to log in to the source server as user **root**.
2. Install rsync.

   yum install rsync



3. Enter **y** and press **Enter**.

4. Display rsync details.

   rsync --version

   If the following information is displayed, rsync has been installed:

```
[redacted]# rsync --version
rsync  version 3.1.2  protocol version 31
Copyright (C) 1996-2015 by Andrew Tridgell, Wayne Davison, and others.
Web site: http://rsync.samba.org/
Capabilities:
    64-bit files, 64-bit inums, 64-bit timestamps, 64-bit long ints,
    socketpairs, hardlinks, symlinks, IPv6, batchfiles, inplace,
    append, ACLs, xattrs, iconv, symtimes, prealloc

rsync comes with ABSOLUTELY NO WARRANTY.  This is free software, and you
are welcome to redistribute it under certain conditions.  See the GNU
General Public Licence for details.
```

5. Start the Agent.

   ./startup.sh

6. Read the displayed information carefully, enter **y**, and press **Enter**.

   Figure 4-9 Confirmation

```
After being started, the migration Agent collects system configuration information and uploads the
information to SMS for migration task creation. The information to be collected includes server IP
address and MAC address. For details, see the Server Migration Service User Guide. Are you sure you
 want to collect the information?(y/n)y
```

7. Enter the AK and SK of the account that you migrate to.

   When the following information is displayed, the Agent has been started up and will automatically start reporting source server information to SMS.

```
Please input AK(Access Key ID) of [redacted]:
Please input SK(Secret Access Key) of [redacted]:
agent is starting...
sms agent start up successfully!
check the source server in Server Migration Service Console now!
You can use the agent-cli tool to monitor the sms agent
```

SUSE

1. Use PuTTY or another SSH client to log in to the source server as user **root**.
2. Install rsync.

   zypper install rsync

```
[redacted]# zypper install rsync
Loading repository data...
Reading installed packages...
Resolving package dependencies...

The following NEW package is going to be installed:
  rsync

1 new package to install.
Overall download size: 363.0 KiB. After the operation, additional 713.0 KiB
will be used.
Continue? [y/n/? shows all options] (y):
```

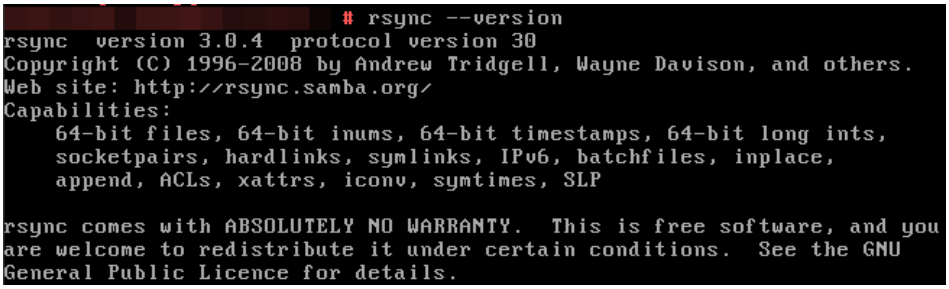
3. Enter **y** and press **Enter**.

```
Continue? [y/n/? shows all options] (y): y
Retrieving package rsync-3.0.4-2.53.6.1.x86_64 (1/1), 363.0 KiB (713.0 KiB unpac
ked)
Retrieving: rsync-3.0.4-2.53.6.1.x86_64.rpm [done]
Installing: rsync-3.0.4-2.53.6.1 [done]
Additional rpm output:
insserv: warning: script 'S01agentwatch' missing LSB tags
insserv: warning: script 'agentwatch' missing LSB tags
```

4. Display rsync details.

   rsync --version

   If the following information is displayed, rsync has been installed:

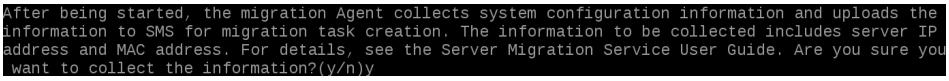


5. Start the Agent.

   ./startup.sh

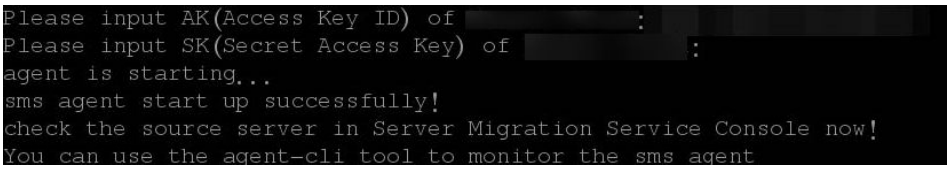
6. Read the displayed information carefully, enter **y**, and press **Enter**.

   Figure 4-10 Confirmation



7. Enter the AK and SK of the account that you migrate to.

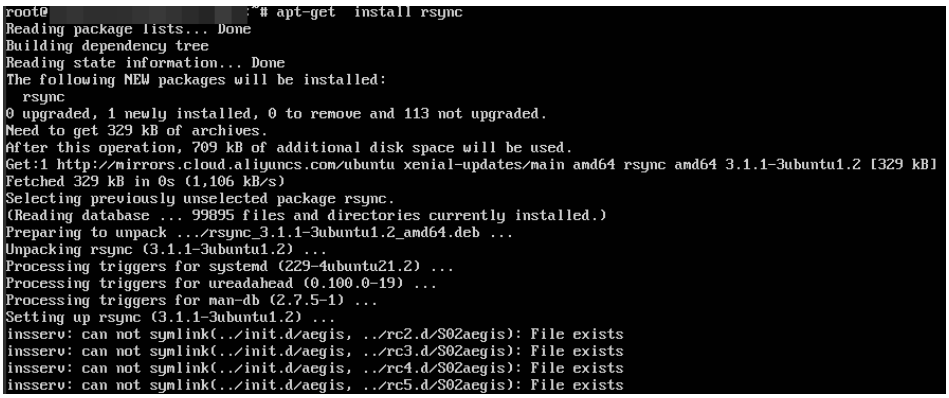
   When the following information is displayed, the Agent has been started up and will automatically start reporting source server information to SMS.



Ubuntu

1. Use PuTTY or another SSH client to log in to the source server as user **root**.
2. Install rsync.

   apt-get install rsync



3. Display rsync details.

   rsync --version

   If the following information is displayed, rsync has been installed:

```
[redacted] # rsync --version
rsync  version 3.1.1  protocol version 31
Copyright (C) 1996-2014 by Andrew Tridgell, Wayne Davison, and others.
Web site: http://rsync.samba.org/
Capabilities:
    64-bit files, 64-bit inums, 64-bit timestamps, 64-bit long ints,
    socketpairs, hardlinks, symlinks, IPv6, batchfiles, inplace,
    append, ACLs, xattrs, iconv, symtimes, prealloc

rsync comes with ABSOLUTELY NO WARRANTY.  This is free software, and you
are welcome to redistribute it under certain conditions.  See the GNU
General Public Licence for details.
```

4. Start the Agent.

   ./startup.sh

5. Read the displayed information carefully, enter **y**, and press **Enter**.

```
After being started, the migration Agent collects system configuration information and uploads the
information to SMS for migration task creation. The information to be collected includes server IP
address and MAC address. For details, see the Server Migration Service User Guide. Are you sure you
 want to collect the information?(y/n)y
```

6. Enter the AK and SK of the account that you migrate to.

   When the following information is displayed, the Agent has been started up and will automatically start reporting source server information to SMS.

```
Please input AK(Access Key ID) of [redacted] :
Please input SK(Secret Access Key) of [redacted] :
agent is starting...
sms agent start up successfully!
check the source server in Server Migration Service Console now!
You can use the agent-cli tool to monitor the sms agent
```

4.5.10 How Do I Resolve Error "The application cannot be started due to incorrect parallel configuration" When I Start the Agent?

Symptom

When you started the Windows Agent (Python 2), you received error message "SMS.5109 The application cannot be started due to incorrect parallel configuration."

Solution

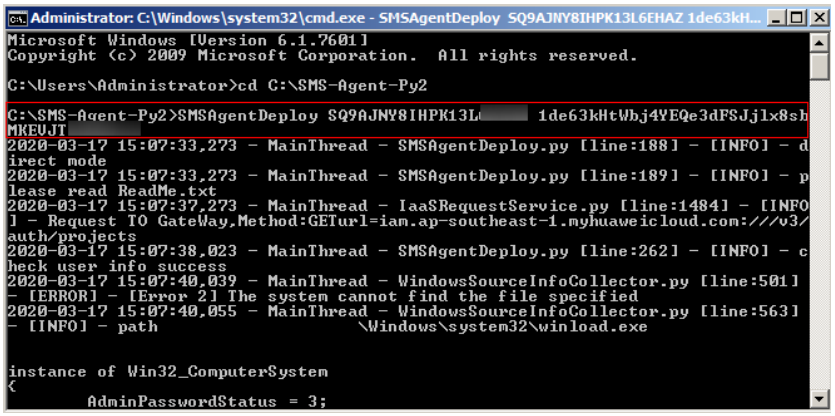
For details, see **Why Does the Agent Not Start the First Time I Launch It?**

4.5.11 Why Does the Agent Not Start the First Time I Launch It?

Due to the permission structure on some Windows machines, the Agent cannot be started the first time you launch it. If this happens:

1. Right-click the **Start** menu.
2. Click **Run** and enter **cmd**.
3. Enter **cd C:\SMS-Agent-Py2** to switch to the Agent installation directory. Run **SMSAgentDeploy.exe**, as shown in **Figure 4-11**.

Figure 4-11 Starting SMSAgentDeploy.exe



NOTE

- You must have a valid AK/SK pair.
- If message "[401:{"error_msg": " Incorrect IAM authentication in formation: xxx xxx not exist","error_code":"APIGW.0301","request_id":"xxx"} "]" is displayed during the execution, check whether the entered AK and SK are correct.

4.5.12 Why Does the Windows Agent Executable Not Run When I Double-Click It?

Symptom

You double-clicked the Windows Agent executable to install the Agent, but the file did not run.

Possible Causes

The file is blocked by the system.

Solution

Right-click **SMS-Agent-py*.exe** and select **Properties** from the shortcut. In the **Security** area of the **General** tab, select **Unblock**, and run the file again.

4.5.13 How Do I Fix Error "Failed to start the I/O monitoring module" When I Start the Agent?

Symptom

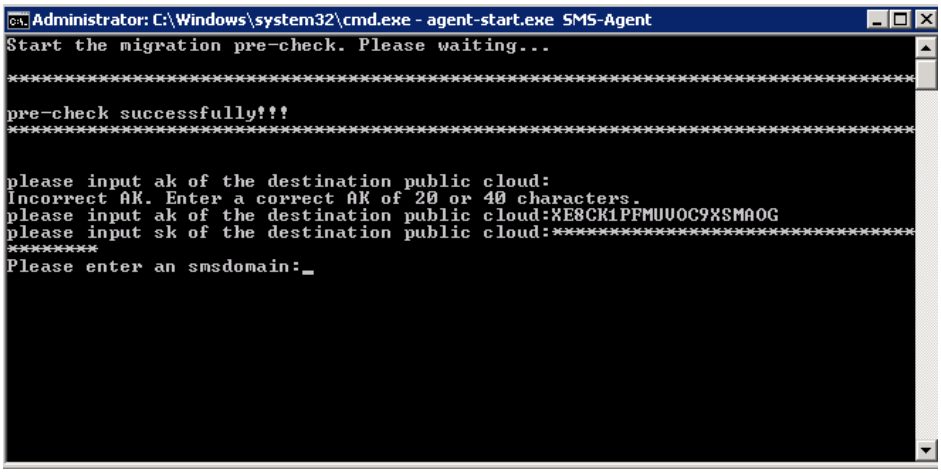
When you started the Agent, you received error message "Failed to start I/O monitoring."

Procedure

Perform the following operations:

1. Uninstall the Agent and re-install it.
   a. If the Agent (Python 3) is installed, enter the AK/SK pair and SMS domain name when prompted.
   b. If the Agent (Python 2) is installed, enter the AK/SK pair and SMS domain name when prompted, as shown in **Figure 4-12**. If no prompt is displayed, double-click **start.bat** in the installation directory and enter the AK and SK when prompted.

   Figure 4-12 Entering the AK/SK pair and SMS domain name

2. Check whether antivirus software is installed on the source server.
   a. If any antivirus or security software is installed, or the firewall is enabled, a pop-up window may be displayed indicating the I/O monitoring driver was blocked. Allow the system to run the I/O monitoring process.
   b. If there is no pop-up warning, but the driver is blocked, you need to start the I/O monitoring driver manually. In this case, uninstall the antivirus software.

   NOTE

   Some antivirus software has persistent blocking functions and may block the driver even if disabled.

3. Modify the configuration file to disable I/O monitoring.

   If you do not need to synchronize data, you can modify the configuration file to disable I/O monitoring.

   In the Agent installation directory **config**, change the value of **enablesync** to **False** in the **g-property.cfg** file, and then restart the Agent.

Figure 4-13 Modifying the **g-property.cfg** file

```
[ssl_config]
servercheck = False

[property]
times = 1000
file_exist_check = C:\Windows\system32\DRIVERS\atapi.sys,C:\Windows\system32\DR
enablesync = False
smsuserid = 73c9354840668452fbd7dff67432f4084
wmi = True
targetip =
heartmonitorday = 7
stopsync = 0

[enviromentcheck]
vss depend service = RPCSS,EventSystem,SENS,VSS,SWPRV,COMSYSAPP

[linux.config]
linux.support.filesystem = ext2,ext3,ext4,vfat,xfs,reiserfs
linux.unsupport.filesystem = btrfs
tar.exclude.dir = /proc/*,/sys/*,/lost+found/*,/var/lib/ntp/proc/*
tar.check.schedule.times = 4
tar.interval = 30
```

4.5.14 How Do I Fix Error "INTERNAL ERROR: cannot create temporary directory!" When I Start the Agent?

Symptom

When you started the SMS-Agent-Py2, you received error message "INTERNAL ERROR: cannot create temporary directory!"

Possible Causes

Some files will be generated in a temp directory of the C: drive when you install the Agent. This error occurs if the available space of the C: drive is insufficient or if you do not have the permission to create a temp directory there.

Solutions

- Check how much space is available on the C: drive. If there is not enough space, clean up the drive.
- Check whether you can create a temp directory on the C: drive. You may need to obtain write permissions.

4.5.15 How Do I Resolve Error "AK/SK authentication failed. Ensure that the system time is consistent with the standard time and the AK and SK are correct" When I Start the Agent?

Symptom

The AK and SK of your account were entered in the Agent, but the AK/SK-based authentication fails. The specific error message depends on the OS.

- Windows: AK/SK authentication failed. Ensure that the system time is consistent with the standard time and the AK and SK are correct."
- Linux: AK/SK authentication failed. Ensure that the system time is consistent with the standard time and the AK and SK are correct.

  NOTE

  For details about how to obtain an AK/SK pair, see **How Do I Create an AK/SK Pair for an Account?** or **How Do I Create an AK/SK Pair for an IAM User?**

Possible Causes

Possible causes are:

- The entered AK or SK is incorrect.
- The system time of the source server is consistent with the local standard time.
- The time zone in the source server is configured incorrectly.
- The AK/SK pair has been deleted or disabled.
- The programmatic access method is not enabled for the account you used for migration.

Handling Methods

- Case 1: The entered AK or SK is incorrect.

  Check whether the entered AK and SK of the account is correct, especially whether any spaces or characters are missed during the copy. Enter the AK/SK pair for authentication again.
- Case 2: The system time of the source server is consistent with the local standard time.

  Check whether the system time of the source server is consistent with the standard time of the time zone where the source server is located.

  If it is not, change the system time to the local standard time, and enter the AK/SK pair for authentication again.

  CAUTION

  If services on the source server depend on the system time, check whether the time can be changed to avoid impact on services.

- Case 3: The time zone in the source server is configured incorrectly.

  Change the time zone in the source server so that the system time plus the time zone is equal to the standard UTC time. For details, see section "Changing the Time Zone" in *Elastic Cloud Server User Guide*. Enter the AK/SK pair for authentication again.

- Case 4: The AK/SK pair has been deleted or disabled.

  Choose **My Credentials** > **Access Keys** to check whether the AK is in the list.

  – If it is not, change or create an AK.

  – If it is, check whether it is disabled. If the AK is disabled, enable it.

- Case 5: The programmatic access method is not enabled for the account you used for migration.

  a. Log in to the management console.

  b. Click the username in the upper right corner and choose **Identity and Access Management**.

  c. In the navigation pane on the left, choose **Users** and click the username you used for migration.

  d. On the **Basic Information** tab page, check whether **Programmatic access** is selected for **Access Type**.

  e. If it is not, click , select **Programmatic access**, and click **OK**.

4.5.16 How Do I Troubleshoot Failures of Pasting the AK/SK Pair When I Start the Agent (Python 2)?

Symptom

When you started the SMS-Agent (Python 2), you could not paste the AK/SK pair by right-clicking in the command window.

Prerequisites

You have obtained the AK/SK pair. For details, see **How Do I Create an AK/SK Pair for an Account?** or **How Do I Create an AK/SK Pair for an IAM User?**

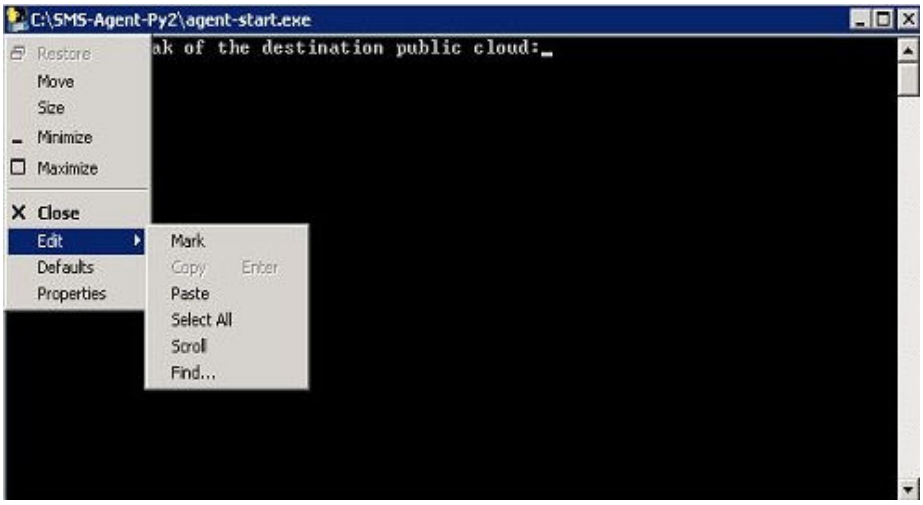
Solution

Step 1 Log in to the source server.

Step 2 Go to the Agent installation directory **C:\SMS-Agent-Py2** and double-click **agent-start.exe.**

Step 3 Copy the AK, click the icon in the upper left corner of the window, choose **Edit** > **Paste** from the displayed menu, and press **Enter**.

Step 4 Copy the SK, click the icon in the upper left corner of the window, choose **Edit** > **Paste** from the displayed menu, and press **Enter**.

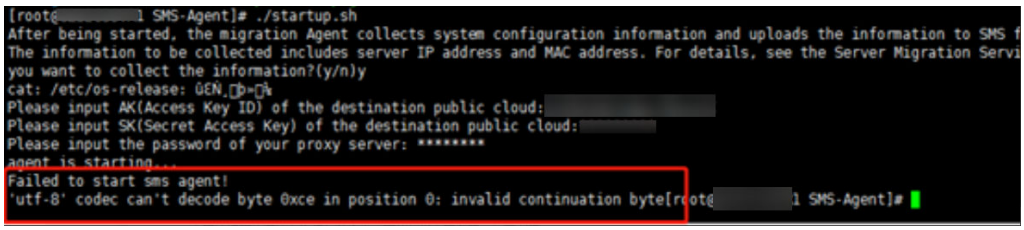


----End

4.5.17 How Do I Resolve Error "utf-8 codec can't decode byte 0xce in position0: invalid continuation byte" When I Start the Agent?

Symptom

In Linux, after you ran **./startup.sh** or **bash startup.sh** to start the Agent, the following message was displayed: "utf-8 codec can't decode byte 0xce in position0: invalid continuation byte."



Possible Causes

The character set of the source system is incorrect and is incompatible with SMS. As a result, the Agent could not be started.

Handling Method

1. Log in to the source server.
2. Set the character set.
   ```
   export LANG="en_US.UTF-8"
   ```
3. Restart the Agent. If the problem persists, set the character set again.
   ```
   export LC_ALL="en_US.UTF-8"
   export LANG="en_US.UTF-8"
   ```

Impact Scope

Setting the character set affects only the current shell and applications in the shell. It does not affect your files or other applications.

4.5.18 How Do I Resolve Error "Failed to load wmi" During the Agent Startup?

Symptom

When you started the Agent, the message "SMS.1205 Failed to load wmi" was reported.

Possible Causes

Files related to Windows Management Instrumentation (WMI) are missing or damaged. In Windows, the Agent uses the WMI module to collect source server details, such as the CPU, memory, and disks details. The missing or damaged WMI-related files need to be restored.

CAUTION

- WMI will be stopped during the restoration. Confirm that stopping WMI will not affect services on the source server. The restoration will also change the files on the source server, which may involve certain risks. It is recommended that you perform the operations on a cloned source server first.
- If the issue persists, you can create an ECS by referring to "Creating a Windows ECS from an Image".

Restoring WMI

Step 1 Right-click **This Computer** in the navigation pane on the left in your file explorer and choose **Manage** from the shortcut menu.

Step 2 On the **Computer Management** page, choose **Services and Applications** > **Services**. Stop **Windows Management Instrumentation**.

Step 3 Change **C:\Windows\System32\wbem\repository** to **C:\Windows\System32\wbem\repository_old**.

Step 4 Start **Windows Management Instrumentation**.

Step 5 Open the cmd window as administrator.

Step 6 Go to the **C:\Windows\System32\wbem** directory.

cd C:\Windows\System32\wbem

Step 7 Restore WMI.

for /f %s in ('dir /b *.mof') do mofcomp %s

for /f %s in ('dir /b en-us*.mfl') do mofcomp en-us\%s

Step 8 Restart the Agent.

----End

4.5.19 How Do I Fix the Agent Startup Failures Due to Agent Files Write or Read Failures?

Symptom

When you install the Agent on a Windows source server, the system displayed a message indicating that the Agent failed to be installed because Agent file cannot be written or opened for writing.

Possible Causes

- If a message indicating a write failure is displayed, it may be that there is not enough space on the system disk of the source server.
- If a message indicating a read failure is displayed, the possible cases are as follows:
  a. Role permissions are insufficient.
  b. Antivirus software is blocking access to the files.

Agent Files Write Failure

- Windows: There is a partition of 600 MB or larger, but the available space is less than 320 MB. There is a partition smaller than 600 MB, but the available space is less than 40 MB.
- Linux: The available space on the root partition is less than 200 MB.

Agent Files Read Failure

1. Install the Agent as administrator.
2. Disable the antivirus software and try again. If the error persists, uninstall the antivirus software and try again.

4.5.20 How Do I Restart the Agent?

Windows

- Windows Agent (Python 3)

  1. Right-click the SMS-Agent icon in the task tray and choose **Quit** from the shortcut menu.

  2. Open the **C:\SMS-Agent-Py3** folder and double-click **SMS-Agent.exe**.

  3. On the page that is displayed, enter the AK/SK pair when promoted and click **Start**.
- Windows Agent (Python 2)

  1. Open the **C:\SMS-Agent-Py2** folder and double-click **restart.bat**.

  2. In the CMD window that is displayed, enter the AK/SK when prompted.

Linux

1. Go to the directory where the SMS-Agent installation package is decompressed and run **./restart.sh**.

2. On the page that is displayed, enter the AK/SK pair when prompted.

4.5.21 How Do I Fix Agent Startup Failures Due to Insufficient Space in /tmp on a Linux Source Server?

Symptom

When you ran **sh startup.sh** to start the SMS Agent, the following message was displayed:

```
Failed to write all bytes for cffibackend.cpython-36m-x86_64-linux.gnu.so
fwrite: No space left on device
```

Possible Causes

When the Agent is being started, directories and files are generated in the **/tmp** directory on the source server. These files will occupy about 40 MB of space. You need to reserve more than 100 MB space for the **/tmp** directory.

Solution

Step 1 Log in to the source server.

Step 2 Run the **df -lh** command to check whether there is a volume mounted to the **/tmp** directory. If there is, check the available space for that volume.

Step 3 If the available space in the **/tmp** directory is insufficient for the mounted volume, delete unnecessary files or expand the capacity of the volume mounted to the **/tmp** directory.

----End

4.5.22 How Do I Fix Error "Agent startup failed because the noexec permission is not allowed on /tmp for SMS Agent. Please remount /tmp without noexec" When I Start the Linux Agent?

Symptom

When you ran **sh startup.sh** to start the SMS Agent, the following message was reported: "SMS.5102 Agent startup failed because the noexec permission is not allowed on /tmp for SMS Agent Please remount /tmp without noexec."

Possible Causes

This problem occurs because a block device is mounted to the /tmp directory, but the exec permission was not assigned or the noexec permission was assigned during the mounting.

Solution

Step 1 Log in to the source server.

Step 2 Run **mount -l | grep /tmp**. If information similar to the following is displayed, the noexec permission is assigned:

```
/dev/vdb1 on /tmp type ext4 (rw, noexec, relatime, data=ordered)
```

Step 3 Remount the block device to the **/tmp** directory. Do not assign the noexec permission during the mounting. Alternatively, run **mount -o remount exec /tmp** to assign the **exec** permission.

Step 4 Run **mount -l | grep /tmp** again. If information similar to the following is displayed, restart the Agent.

```
/dev/vdb1 on /tmp type ext4 (rw, relatime, data=ordered)
```

----End

4.5.23 How Do I Resolve Error "Only servers with x86 architecture can be migrated"?

Symptom

When you started the Agent, you got the message "Only servers with x86 architecture can be migrated."

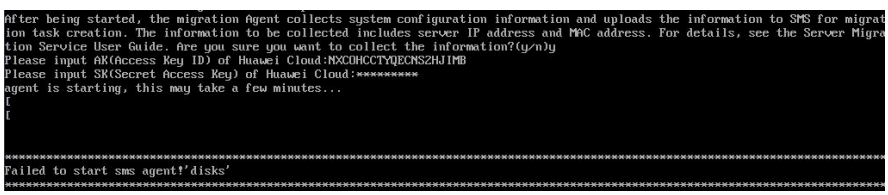
Possible Causes

SMS can only migrate x86 servers.

4.5.24 How Do I Fix Error "Failed to start sms agent! 'disks'" When I Start the Agent on a Linux Source Server?

Symptom

When you started the Agent on a Linux source server, message "Failed to start sms agent!'disks'" was displayed.



Possible Causes

Possible causes are:

1. Multiple volume groups are with the same name.

   Check whether the **SmsAgent_Error.log** file records "Multiple VGs found with the same name".

   SMS requires that a Linux source server cannot have volume groups with the same name, or the Agent will be unable to collect information about the source server disks. Run the **vgdisplay** command to check whether there are volume groups with the same name, and run the **lvdisplay** command to view logical volume properties, such as the host name and creation time.

2. The **fdisk** command cannot be found on the source server.

   Run the **fdisk -l** command on the source server to check whether the **fdisk** command exists in your path. If **fdisk** cannot be found, the possible cause is that the **/sbin** directory is not included in PATH, or the **/sbin** directory is included in PATH but does not take effect. This problem may occur after you run the **su** command to switch to the **root** user.

Solutions

1. If there are volume groups with the same name in Linux, these volume groups and the corresponding logical volumes cannot be mounted or read.

   You can detach the disks in the volume groups that fail to be mounted from the source server and attach them to another server. Then check whether the data in the disks needs to be migrated.

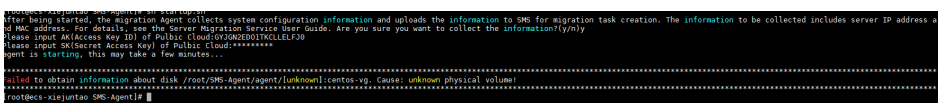
   - If the data needs to be migrated, run the **vgrename** command to rename each of these volume groups, and attach the disks in these groups back to the source server. Then restart the SMS Agent.
   - If the data does not need to be migrated, restart the SMS Agent. After the migration is complete, attach the disks back to the source server.

2. Run the **source /etc/profile** command and restart the SMS Agent.

4.5.25 How Do I Fix Error "Failed to obtain information about disk *X*" When I Start the Agent on a Linux Source Server?

Symptom

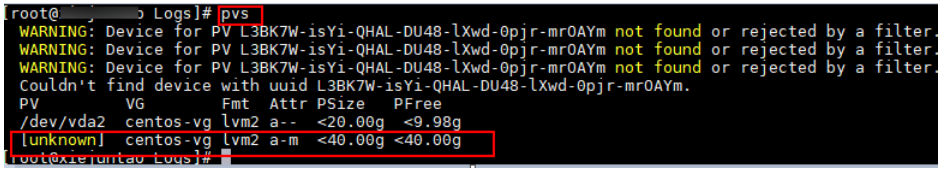
When you started the Agent on a Linux source server, you received message "**Failed to obtain information about disk %s. Cause: unknown physical volume!**"



Possible Causes

The source server uses LVM and there are unknown physical volumes on the server. The Agent cannot collect the information about these volumes.

You can run the **pvs** command on the source server to check the details about its physical volumes.



Solutions

Step 1 Contact technical support of the source platform to restore the source server.

Step 2 After the source server is restored, run the **pvs** command to check if there are still any unknown physical volumes on the server.

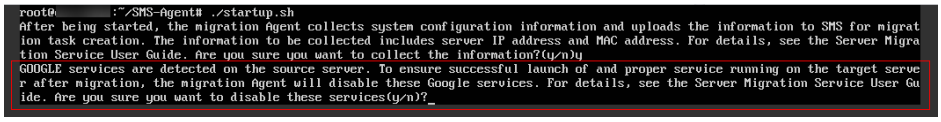
If there are no unknown physical volumes, perform the migration again.

----End

4.5.26 How Do I Choose When the System Asks Whether to Disable the Google Services Detected on My Source Server on the Google Cloud?

Description

When I started the Agent on the Linux source server running on the Google Cloud, the system asked me whether to disable the detected Google services.



Background

Some Google Cloud services depend on the Google Cloud. After the source server is migrated to the cloud platform, these Google Cloud services cannot run properly. As a result, after the migration the target server may fail to be launched or other services may fail to be started. Before the migration, read **Description of Disabling Google Services** and make evaluations based on service requirements.

NOTE

- Disabling these services does not affect the source server. It only affects the configuration of startup services on the target server.
- If your services depend on these Google Cloud services, contact technical support before the migration.

- If you choose to disable these Google services, enter **y**. During the target server configuration, the Agent will disable these services on the target server.
- If you choose not to disable these Google Cloud services, enter **n**. All the service settings will be retained on the target server after the migration. But the target server may fail to be launched or some services may fail to be started.

Description of Disabling Google Services

- Servers with startup services in the **/etc/systemd/system** directory, such as those running Ubuntu, CentOS 8, or CentOS 9

  If you choose to disable the Google services, the Agent will only delete the soft links related to these services in the **/etc/systemd/system** directory. The service files pointed by the soft links are not affected.

  NOTE

  Deleting the soft links of a service prevents the service from starting automatically at startup but does not affect the actual files of the service.

- Servers with startup services in the **/etc/init** directory, such as those running CentOS 6

  If you choose to disable the Google services, the Agent will check the configuration files whose names start with **google** in the **/etc/init** directory, move these configuration files to **/etc/backup_googleconf**, and compress the folder into package **google_conf_bak.tar.gz** for backup.

4.5.27 How Do I Fix Error "SMS.0410: Failed to obtain NicName/IPAddress information of source server " When I Start the Agent on a Linux Server?

Symptom

When you started the Agent on a Linux server, one of the following messages was displayed:

- SMS.0410: Failed to obtain NicName information of source server.

- SMS.0410: Failed to obtain IPAddress information of source server.

Possible Causes

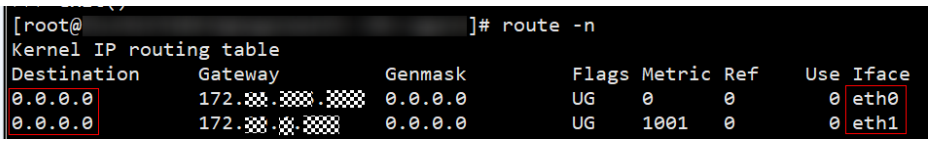
If the source server has multiple NICs, the Agent may fail to obtain the default gateway information of the source server. As a result, the correct NIC name, MAC address, and IP address cannot be obtained.

Solutions

- Solution for error "SMS.0410: Failed to obtain NicName information of source server"

  a. View the routing table.

  ```
  #route -n
  ```

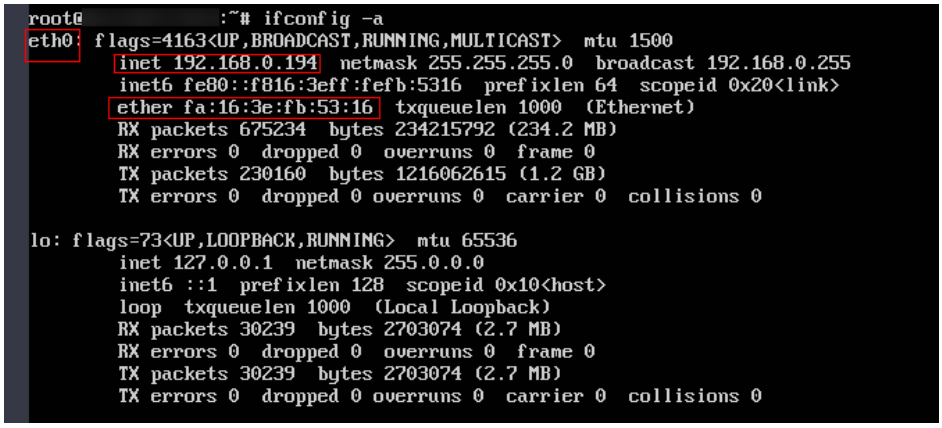
The following table describes the parameters.

Parameter	Description
Destination	The destination IP address. The gateway corresponding to 0.0.0.0 is the default gateway.
Gateway	The gateway IP address.
Iface	The network interface.

As shown in the preceding figure, if the source server has multiple default gateways, the Agent may fail to obtain the default gateway information. In this case, proceed with the subsequent steps.

b. Check the network configuration.

```
#ifconfig -a
```



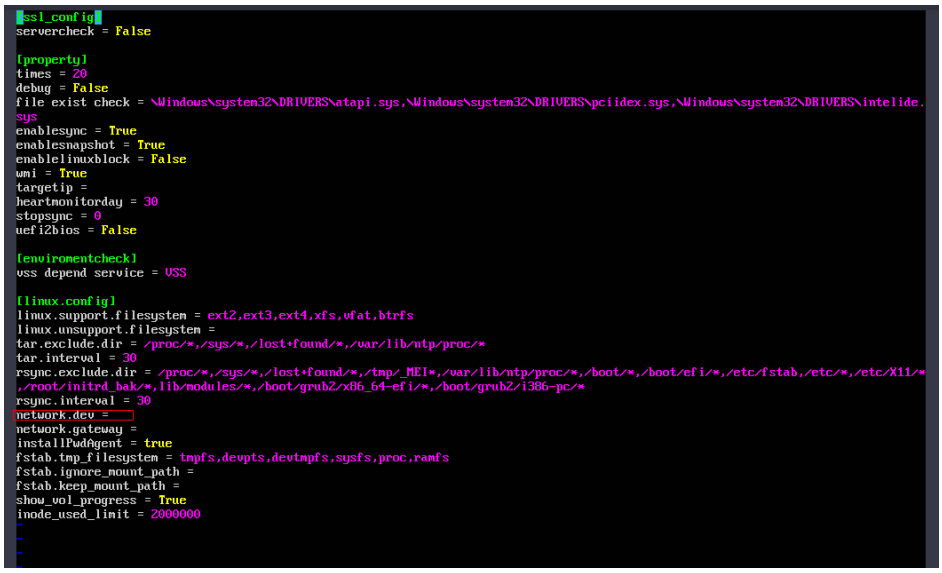
NOTE

- The leftmost column lists NICs, such as ethx, ensx, and enp0sx.
- **inet** is the IP address of a NIC.
- **ether** is the MAC address of a NIC.

c. Modify **network.dev** in the **.../SMS-Agent/agent/config/g-property.cfg** configuration file.

You need to check which NIC of the source server is used for migration. Then set **network.dev** to the name of the NIC used for migration.

For example, the NICs queried in step 2 include **eth0**, **eth1**, and **eth2**. The NIC used for migration is **eth0**, so set **network.dev** to **eth0**.



d. After the configuration is complete, restart the Agent.

- Solution for error "SMS.0410: Failed to obtain IPAddress information of source server"

  a. Check whether the **network.dev** parameter in the **.../SMS-Agent/agent/config/g-property.cfg** file has been configured.

     - If it has, go to step **2**.
     - If it has not, go to **3**.

  b. Check whether the NIC specified by **network.dev** is correct by referring to **Solution for error 1**.

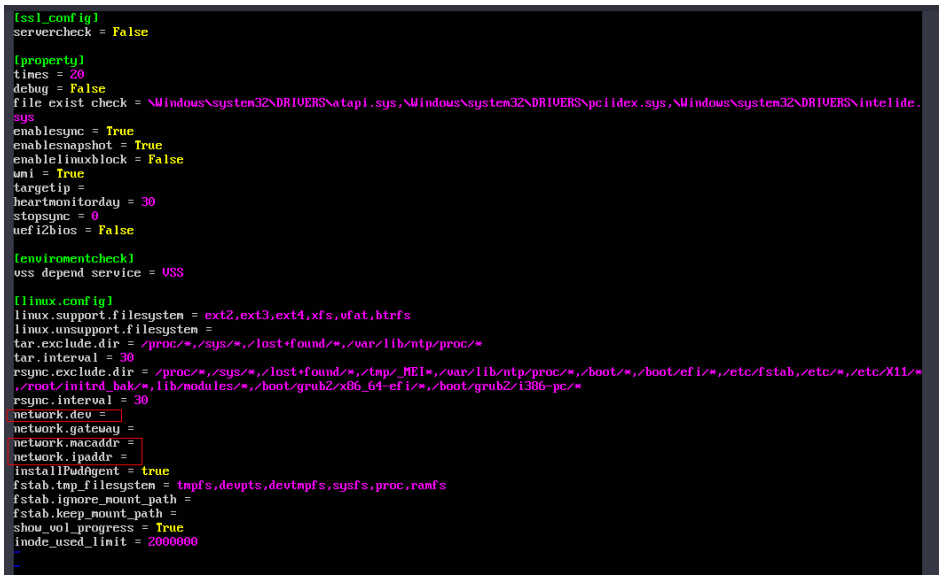
     - If the configuration is incorrect, modify it and restart the Agent. If the problem persists, go to step **3**.
     - If the configuration is correct, go to step **3**.

  c. Modify **network.macaddr** and **network.ipaddr** in the **.../SMS-Agent/agent/config/g-property.cfg** configuration file.

     Set **network.macaddr** and **network.ipaddr** to the values of **inet** (IP address) and **ether** (MAC address) corresponding to the correct NIC queried in **step 2 in handling error 1**.

     network.macaddr = *xx-xx-xx-xx-xx-xx (MAC address)*

     network.ipaddr = *xxx.xxx.xxx.xxx (IP address)*



CAUTION

Both the MAC address and IP address need to be configured. The six groups of characters in the MAC address must be separated by hyphens (-).

d. After the configuration is complete, restart the Agent.

4.5.28 What Do I Do If the SMS-Agent Fails to Start and Error "SMS.0609 An earlier version of Agent is detected. Please exit the old Agent, uninstall the old Agent completely, and install the latest version" Is Displayed?

Symptom

During the startup of the SMS-Agent, the Agent reported that the pre-migration check failed and displayed the following message:

- Windows: SMS.0609 An earlier version of Agent is detected. Please exit the old Agent, uninstall the old Agent completely, and install the latest version.
- Linux: SMS.0609 An earlier version of Agent is detected. Please exit the old Agent, uninstall the old Agent completely, and install the latest version.

Possible Causes

If an earlier version of the Agent is not or not completely uninstalled, files cannot be completely replaced and the latest version cannot be installed correctly.

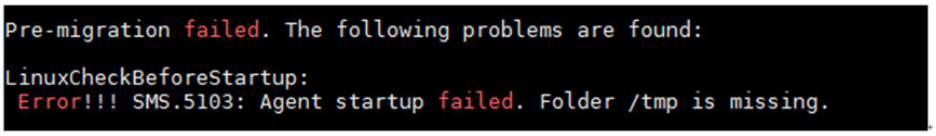
Solutions

- **Windows**
  a. Open the **Task Manager** and check whether the SMS-Agent program is running.
     - If the program is running, stop it and go to step 2.
     - If the program is not running, go to step 2.
  b. Uninstall the SMS-Agent of the earlier version. For details, see **How Do I Uninstall the SMS-Agent from the Source Server?**
  c. Install the SMS-Agent of the latest version . For details, see **Installing the SMS-Agent on Linux**.
- **Linux**
  a. Uninstall the SMS-Agent of the earlier version. For details, see **How Do I Uninstall the SMS-Agent from the Source Server?**
  b. Install the SMS-Agent of the latest version . For details, see **Installing the SMS-Agent on Linux**.

4.5.29 How Do I Fix Error "SMS.5103: Agent startup failed." When I Fail to Start the Agent on a Linux Source Server? Folder /tmp is missing

Symptom

On a Linux source server, the Agent failed to be started, and message"SMS.5103: Agent startup failed. Folder /tmp is missing" was displayed.



Possible Causes

The **/tmp** folder is missing on the source server.

Check whether there is a **/tmp** folder.

```
# ls
```

Solution

Step 1 Create the **/tmp** folder on the source server.

```
#mkdir /tmp
```

Step 2 Check that the **/tmp** folder has been created and restart the SMS-Agent.

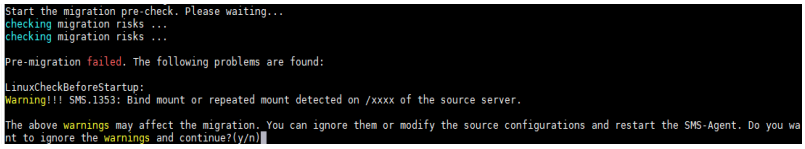
```
# ls
```

----End

4.5.30 How Do I Fix Error "SMS.1353: Bind mount or repeated mount detected on /xxx of the source server" When I Fail to Start the Agent on a Linux Source Server?

Symptom

On a Linux source server, the Agent failed to be started, and the message "SMS.1353: Bind mount or repeated mount detected on /xxx of the source server." was displayed.



Possible Causes

The source server may have repeated or bind mounts. In this case, data may be migrated repeatedly or the disk space of the target server may be insufficient.

A repeated mount indicates that a disk or partition is mounted on multiple directories. For example, disk **/dev/vda1** is mounted on both the root directory **/** and the **/home/mnt_test** directory.

A bind mount indicates that the directory where a disk or partition is mounted on another directory. For example, disk **/dev/vda1** is mounted on the root directory **/**, and the root directory **/** is mounted on the **/root/bind_test/bind_mount** directory.

The common features of repeated mounts and bind mounts are as follows:

- If the data in a mounted directory changes, the changes will be synchronized to other mounted directories.
- A disk or partition is identified at several locations by the **mount** command.

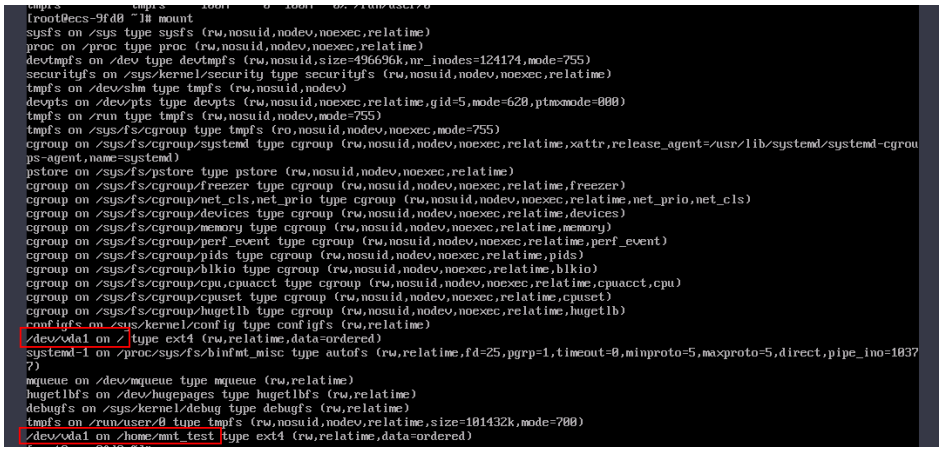
NOTE

The disks and folders mentioned in this section are only examples. Replace them as required.

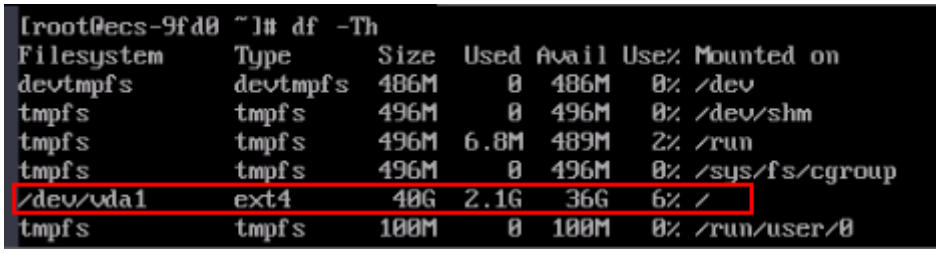
- **Possible cause 1: Repeated mounts**

  Check Method

  a. Run **mount** on the source server to check whether a disk or partition is mounted on multiple directories. In the following figure, the **/dev/vda1** disk is mounted on both the root directory **/** and the **/home/mnt_test** directory.



b. The SMS-Agent uses **df -TH** to determine how much data is on the source server. As shown in the following figure, even if there are two mount points, only one of them will be returned by **df -TH**. However, because of the two mount points, the data in **/dev/vda1** gets migrated twice and the amount of data displayed on the SMS console (which relies on **df -TH**) is less than the amount of data actually migrated.

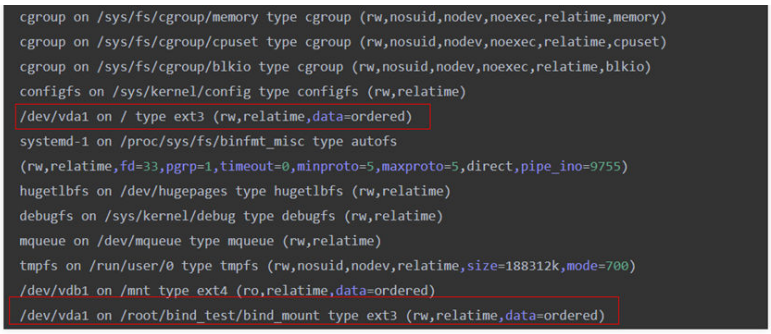


c. Run the **ls** command to check the files in the root directory **/** and **/home/mnt_test**. If the files are the same, it indicates that a repeated mount exists. To learn how to fix this problem, see **•Solution for repeated mounts**.

- **Possible cause 2: Bind mounts**

  Check Method

  a. Run **mount** on the source server to check whether a disk or partition is mounted on multiple directories. In the following figure, the **/dev/vda1** disk is mounted on both the **/** and **/root/bind_test/bind_mount** directories.



  b. Run **df -TH** on the source server. The command output shows that only one mount point can be returned.

```
Filesystem     Type      Size  Used Avail Use% Mounted on
/dev/vda1      ext3       40G  7.3G   31G  20% /
devtmpfs       devtmpfs  911M     0  911M   0% /dev
tmpfs          tmpfs     920M   68K  920M   1% /dev/shm
tmpfs          tmpfs     920M   25M  896M   3% /run
tmpfs          tmpfs     920M     0  920M   0% /sys/fs/cgroup
tmpfs          tmpfs     184M     0  184M   0% /run/user/0
/dev/vdb1      ext4      9.8G   37M  9.2G   1% /mnt
```

c. In the **/root** directory on the source server, run the **# du -h --max-depth=1 ~** command to check how large the **bind_test** folder is.

Run the **# du -h --max-depth=1 ~/bind_test** command to check how large the **/root/bind_test/bind_mount** folder is. As shown in the command outputs, the subdirectory is larger than its parent directory. This indicates a bind mount exists. To learn how to fix this problem, see **•Solution for bind mounts**.

```
[root@ -centos7 ~]# du -h --max-depth=1 ~
160K    /root/rda
1.1M    /root/usr
167M    /root/code
8.0K    /root/.pki
28K     /root/rpmbuild
8.0K    /root/zai
40K     /root/locale
16K     /root/.local
24K     /root/.ssh_p2v_back
13M     /root/scapy-2.4.3
40K     /root/.ssh
8.0K    /root/pip
1.4G    /root/sms2.0
8.0K    /root/.oracle_jre_usage
5.6G    /root/bind_test
15M     /root/test_tools
58M     /root/SMS-Server_1.0.0.2346525
204K    /root/linux
7.2G    /root
[root@ -centos7 ~]# du -h --max-depth=1 ~/bind_test
7.2G    /root/bind_test/bind_mount
9.0M    /root/bind_test/SMS-Static_1.0.0.2488799
12K     /root/bind_test/shell
7.2G    /root/bind_test
```

Solutions

- **Solution for repeated mounts**

  a. Add mount points to be excluded from migration after the **tar.exclude.dir** and **rsync.exclude.dir** parameters in the **.../SMS-Agent/agent/config/g-property.cfg** file in directory where the SMS-Agent is installed on the source server.

  In example 1, if **/home/mnt_test/*** is added to the end of **tar.exclude.dir** and **rsync.exclude.dir**, all files in the **/home/mnt_test/** directory will not be migrated and synchronized.

```
[property]
times = 20
debug = False
file_exist_check = \Windows\system32\DRIVERS\atapi.sys,\Windows\system32\DRIVER
enablesync = True
enablesnapshot = True
enablelinuxblock = False
disableplatformservice = True
wmi = True
targetip =
heartmonitorday = 30
stopsync = 0
uefi2bios = False
controlServerPort = 8899

[enviromentcheck]
vss depend service = VSS

[linux.config]
linux.support.filesystem = ext2,ext3,ext4,xfs,vfat,btrfs
linux.unsupport.filesystem =
tar.exclude.dir = /proc/*,/sys/*,/lost+found/*,/var/lib/ntp/proc/*
tar.interval = 30
rsync.exclude.dir = /proc/*,/sys/*,/lost+found/*,/tmp/_MEI*,/var/lib/ntp/proc/*
itrd_bak/*,lib/modules/*,/boot/grub2/x86_64-efi/*,/boot/grub2/i386-pc/*
rsync.interval = 30
network.dev =
network.gateway =
network.macaddr =
network.ipaddr =
installPwdAgent = true
fstab.tmp_filesystem = tmpfs,devpts,devtmpfs,sysfs,proc,ramfs
fstab.ignore_mount_path =
fstab.keep_mount_path =
show_vol_progress = True
inode_used_limit = 2000000
[windows_config]
efi_check = False
total_size = 0
start_offset = 0
disk_number = 0
start_by_manual = False
~
~
~
~
```

b. (Optional) If you want that the target server has the same mounted directories as the source server after the migration is complete, perform the following operations:

After the migration is complete, modify the mounted directories in the **/etc/fstab** file on the target server, as shown in the figure below. Ensure that the disk **/dev/vdb** on the target server is automatically mounted to the **/mnt** and **/home/mnt_test** directories.

```
# /etc/fstab: static file system information.
#
# Use 'blkid' to print the universally unique identifier for a
# device; this may be used with UUID= as a more robust way to name devices
# that works even if disks are added and removed. See fstab(5).
#
# <file system> <mount point>   <type>  <options>       <dump>  <pass>
# / was on /dev/vda1 during installation
UUID=bbd3ea56-da3b-4e1a-b14e-159e41299ea3 /               ext4    errors=remount-ro 0       1
/dev/vdb  /mnt  ext4   defaults 0 0
/dev/vdb  /home/mnt_test  ext4  defaults 0 0
```

c. Restart the SMS-Agent.

- **Solution for bind mounts**

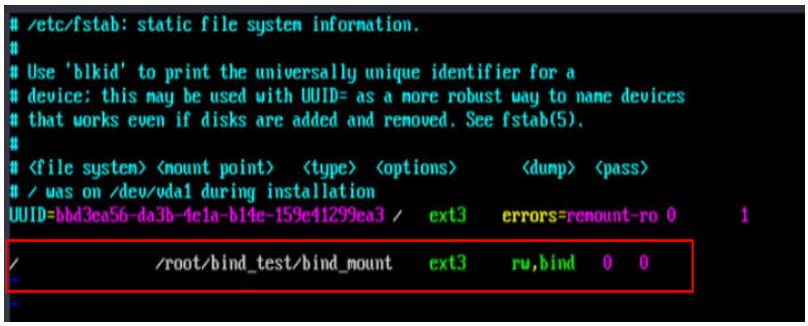
a. Add mount points to be excluded from migration after the **tar.exclude.dir** and **rsync.exclude.dir** parameters in the **.../SMS-Agent/agent/config/g-property.cfg** file in the SMS-Agent installation path on the source server.

In example **2**, if **/root/bind_test/bind_mount/** is added to the end of **tar.exclude.dir** and **rsync.exclude.dir**, all files in the **/root/bind_test/bind_mount/** directory will be excluded from migration and synchronization.

b. (Optional) If you want that the target server has the same mounted directories as the source server after the migration is complete, perform the following operations:

After the migration is complete, modify the mounted directories in the **/etc/fstab** file on the target server, as shown in the figure below. Ensure that partition **/dev/vda1** on the target server is automatically mounted to the **/root/bind_test/bind_mount** directory.

```
/    /root/bind_test/bind_mount  ext3  rw,bind 0 0
```



NOTE

Change the mount directories and mount points based on your requirements. In the command shown in the above figure, the first item (**/**) is the mount directory, the second item (**/root/bind_test/bind_mount**) is the mount point, and the third item (**ext3**) is the file system type. Retain **rw,bind 0 0**.

c. Restart the SMS-Agent.

4.5.31 How Do I Fix Error "SMS.1352: Unknown physical volumes detected on the source server" When I Fail to Start the Agent on a Linux Source Server?

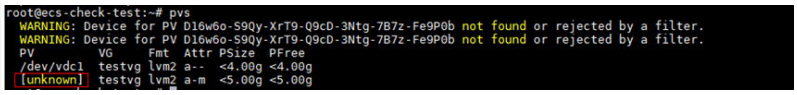
Symptom

On a Linux source server, the Agent failed to be started, and the message "SMS.1352: Unknown physical volumes detected on the source server." was displayed.

Possible Causes

A volume group on the source server is created from two physical volumes, but one of the physical volumes is detached.

As shown in the following figure, the **# pvs** command tells that an unknown physical volume is detected. Volume group **testvg** is created from two physical volumes, but one of the physical volumes is detached.



Solutions

- Solution 1: Attach the unknown physical volume to the source server and then perform the migration again.
- Solution 2: Contact SMS technical support to masquerade unknown physical volumes and perform the migration again.

4.5.32 How Do I Fix Error "SMS.1351: Mount point /xxx detected on the source server, which has no free space. Ensure that there is at least 1 MB of space" When I Fail to Start the Agent on a Linux Source Server?

Symptom

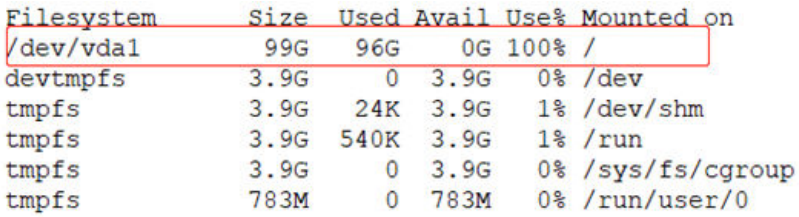
On a Linux source server, the Agent failed to be started, and the message "SMS.1351: Mount point /xxx detected on the source server, which has no free space. Ensure that there is at least 1 MB of space." was displayed.

Possible Causes

A directory used as a mount point on the source server is full.

Solutions

Step 1 Run the **df -TH** command on the source server to identify which directory is full.



```
Filesystem      Size  Used Avail Use% Mounted on
/dev/vda1        99G   96G     0G 100% /
devtmpfs        3.9G     0  3.9G   0% /dev
tmpfs           3.9G   24K  3.9G   1% /dev/shm
tmpfs           3.9G  540K  3.9G   1% /run
tmpfs           3.9G     0  3.9G   0% /sys/fs/cgroup
tmpfs           783M     0  783M   0% /run/user/0
```

Step 2 Distribute the data across different directories to ensure that each directory has at least 1 MB of free space.

Step 3 Run the **df -TH** command again to confirm that there is a required free space in each directory. Then restart the SMS-Agent.

----End

4.6 Disk Management

4.6.1 Why Was a 40 GB EVS Disk Added to the Target Server During the Migration?

SMS creates and attaches a 40 GB EVS disk to each target server temporarily during the migration. These EVS disks are billed on a pay-per-use base. After the migration is complete, these EVS disks will be released. Do not delete this EVS disk during the migration, or the migration will fail.

4.6.2 Why Can't I Attach the Original System Disk Back to a Target Server?

Symptom

If a migration fails, the system disk of the target server is a temporary disk with the disk name starting with **sms**. As a result, the original system disk of the target server cannot be attached back.

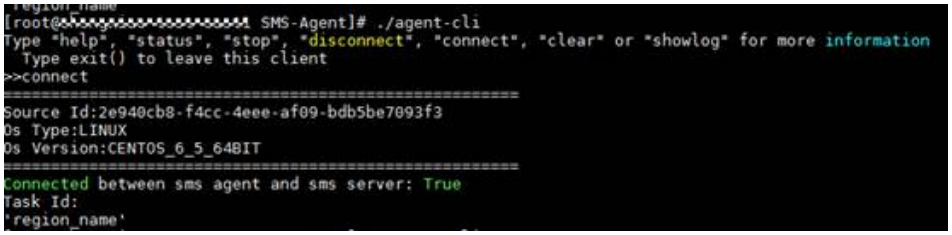
Possible Causes

The temporary system disk was not detached. You need to manually detach the temporary disk.

Procedure

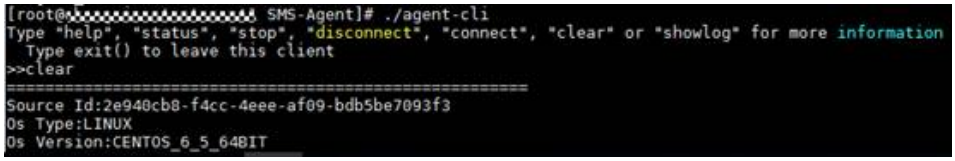
The following uses Linux as an example to describe how to handle this problem.

1. Connect the source server to SMS by switching to the **SMS-Agent** directory on the source server, running **./agent-cli**, entering **connect**, and pressing **Enter**.



2. Run **clear** in the CLI.

   After about a minute, the temporary disk on the target server will be detached and deleted, and the original system disk will be re-attached.



4.6.3 How Do I Resolve Error "Disk info in source server has changed, task fail, please delete the task and then restart the agent"?

Symptom

When you started the migration, you got the error message "SMS.0515 Disk info in source server has changed, task fail, please delete the task and then restart the agent."

Possible Causes

The Agent collects information about the disks on the source server every two hours. This error will occur if the source server disks are changed during the period

from the last collection to the start of migration. Possible changes in source server disks include:

- Disks or partitions were attached or detached to the source server.
- The capacity of a source partition may have been expanded, and now the target disk space is insufficient.
- A large amount of data was written to a source partition, and now the target partition space is insufficient.
- The file system type of the source partition was changed.

Solution

Step 1 Log in to the management console.

Step 2 Click **Service List**. Under **Migration**, click **Server Migration Service**.

The SMS console is displayed.

Step 3 In the navigation pane on the left, choose **Task Management**.

Locate the task to be deleted, and in the **Operation** column, choose **More** > **Delete**.

Step 4 Log in to the source server and restart the Agent. The Agent automatically reports changed source disk information to SMS.

Step 5 Create a migration task for the source server again and start the task. For details, see "Creating and Starting a Migration Task."

----End

4.6.4 How Do I Resize Partitions and Disks When I Migrate a Windows Source Server?

Scenarios

You need to manually resize partitions and disks if:

- The system disk of a source server is larger than 1 TB.
- A file system on the source server is not supported by SMS.
- There are partitions that do not need to be migrated or there are other resizing requirements.

Scenario 1

The source system disk is 1.1 TB, with 100 GB allocated for the system and boot partitions and 1,024 GB for data disk D. You can prepare a 100 GB and a 1,024 GB disk on the target server for receiving data from the source system disk.

The procedure is as follows:

1. Go to the Agent configuration directory on the source server.
   - Agent (Python 3)

C:\SMS-Agent-Py3\config

- Agent (Python 2)

  C:\SMS-Agent-Py2\config

2. Modify the **disk.cfg** file as follows and save it.

```
[volmap]
D = 2
```

NOTE

- **D = 2** indicates that data in disk D will be migrated to the second disk on the target server.
- There are multiple partitions on the source server, and you want to migrate them to different disks on the target server. In this case, modify the **disk.cfg** file in the same way, such as D=2, E=3, F=4.

3. Go to the SMS console, and delete the record corresponding to this source server.
4. Restart the Agent installed on the source server. Go back to the SMS console to check whether the disk information has been changed in the source server details.

CAUTION

This method is not suitable for migrating system and boot partitions, because the system and boot partitions can be migrated only to the first disk on the target server.

Scenario 2

Data disk D on the source server is a FAT32 partition, which caused the source server failed the migration feasibility check. You can exclude this partition from migration using the configuration file.

The procedure is as follows:

1. Go to the Agent configuration directory on the source server.
   - Agent (Python 3)

     C:\SMS-Agent-Py3\config

   - Agent (Python 2)

     C:\SMS-Agent-Py2\config

2. Modify the **disk.cfg** file as follows and save it.

```
[volmap]
D = -1
```

NOTE

D = -1 indicates that disk D will not be migrated.

3. Go to the SMS console, and delete the record corresponding to this source server.
4. Restart the Agent. Go back to the SMS console to check whether the disk information has been changed in the source server details.

Scenario 3

The source server has two data disks, disk D and disk E. You want to migrate the two data disks to the same disk on the target server.

The procedure is as follows:

1. Go to the Agent configuration directory on the source server.
   - Agent (Python 3)

     C:\SMS-Agent-Py3\config
   - Agent (Python 2)

     C:\SMS-Agent-Py2\config
2. Modify the **disk.cfg** file as follows and save it.

   ```
   [volmap]
   E = 2
   ```

   NOTE

   E = 2 indicates that data in disk E will be migrated to the second disk on the target server.
3. Go to the SMS console, and delete the record corresponding to this source server.
4. Restart the Agent. Go back to the SMS console to check whether in the source server details, there is only one data disk which consists of partition D and partition E.

4.6.5 How Do I Shrink the Disk Partitions on a Source Server Running Windows?

Symptom

When you use SMS to migrate a source server running Windows, the disks on the target server should be at least the size recommended on the **Source Management** page. Otherwise, the migration may fail. If you have created a target server running Windows, and the disks on the target server are too small, you can shrink the source server disks to be no larger than the target server disks.

Possible Causes

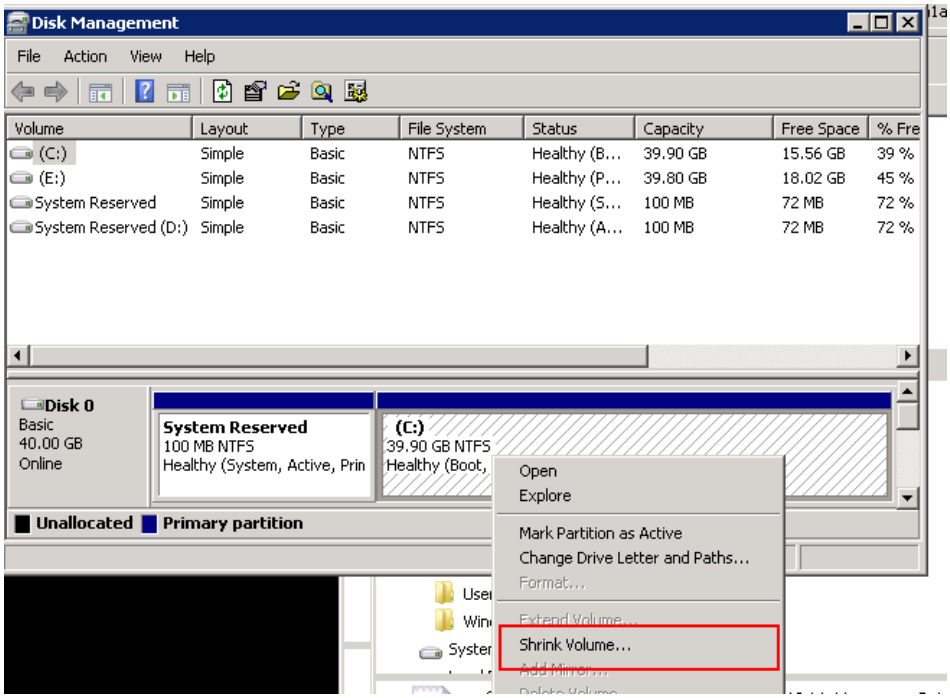
For a migration to be successful, the target server disks must be at least as large as the source disks. If they are not, you need to either scale up the target server disk or shrink the source server disk. On a Windows server, you can shrink disk partitions of the source server using the Windows Disk Management tool.

Procedure

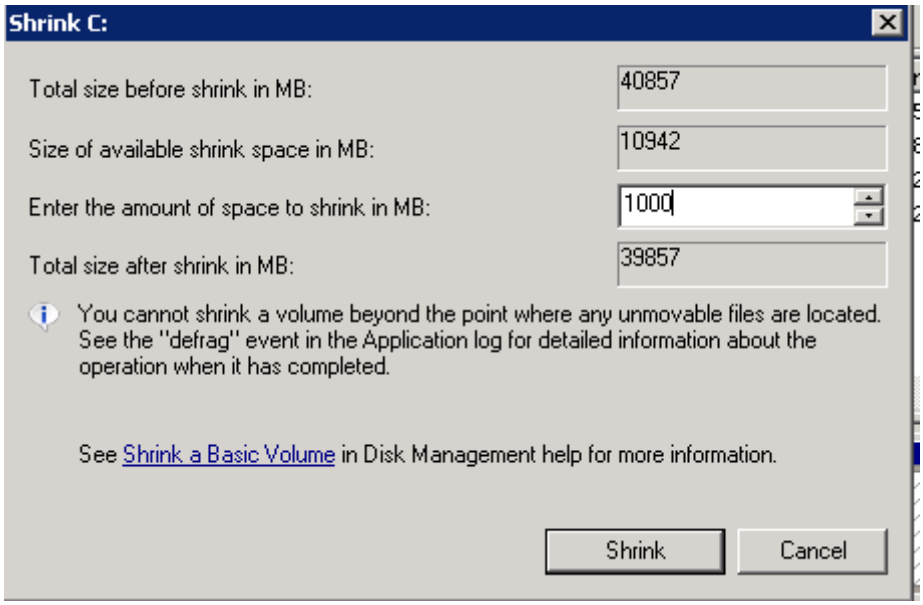
1. Choose **Start**, enter **diskmgmt.msc** in the search box.

   The **Disk Management** tool is displayed.
2. Right-click the partition of the disk you want to shrink and choose **Shrink Volume**.

   The **Shrink Volume** dialog box is displayed.

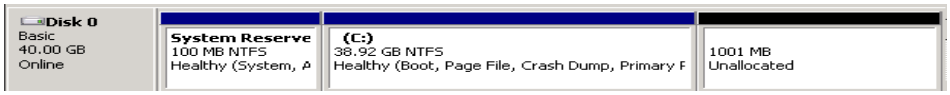


3. Enter the amount you wish to shrink the partition by in the **Enter the amount of space to shrink in MB** text box.



4. Click **Shrink**.
   The new space available is displayed as unallocated space.

Figure 4-14 Disk partition after shrink



5. Log in to the management console.
6. Click **Service List**. Under **Migration**, click **Server Migration Service**.
   The SMS console is displayed.

7. In the navigation pane on the left, choose **Source Management**.

   The **Source Management** page is displayed.

8. On the **Source Management** page, locate the row where the information about the source server resides, click **Delete** in the **Operation** column.

   The **Delete Server** dialog box is displayed.

9. In the **Delete Server** dialog box, confirm information about the source server to be deleted and click **Yes**.
10. Report the information about the source server to SMS again.
    - If the Agent has been uninstalled from the source server, install the Agent again.
    - If the Agent has been installed on your source server, restart the Agent to report the source server information to SMS.

4.6.6 How Do I Exclude a Partition from Migration in Windows?

Procedure

Step 1 Go to the Agent configuration directory on the source server.

- Agent (Python 3)

  C:\SMS-Agent-Py3\config
- Agent (Python 2)

  C:\SMS-Agent-Py2\config

Step 2 Modify the **disk.cfg** file as follows and save it.

[volmap]

D = -1

NOTE

D = -1 indicates that disk D will not be migrated.

Step 3 Restart the Agent. You will see that disk D is not displayed in the source server details. If drive D is still displayed in the source server details, delete the source server record on the SMS console and register the source server with SMS again.

NOTE

This method is only suitable for exclusion before the migration, because restarting the Agent during the migration will cause a migration failure.

----End

4.6.7 How Do I Fix Error "Failed to modify the configuration files of the target server"?

Symptom

When you tried to modify the configuration files of a Linux target server, you got message "SMS.3101 Failed to modify the configuration files of the target server."

Possible Causes

The possible cause for the error is as follows:

- The **/etc/hosts** file may be incorrectly configured.

Solution

- The **/etc/hosts** file may be incorrectly configured.

  Possible cause: The content of the **/boot/grub2/grub.cfg** file is written to the **/etc/default/grub** file by mistake.

  Handling method: On the cloud platform, create an ECS running the same or similar OS as the source server, copy the **/etc/default/grub** file of the new ECS to overwrite that file of your target ECS, and try again.

4.6.8 How Do I Fix Error "Failed to create snapshot"?

Symptom

During the migration, message "Failed to create snapshot" was reported.

Possible Causes

Before data migration from servers running Windows, the VSS module is used to create snapshots to ensure that data on the source and target servers is from the same point in time. If the VSS module on the source server is faulty, the snapshot creation will fail.

Procedure

Step 1 Go to the Agent configuration directory on the source server.

- Agent (Python 3)

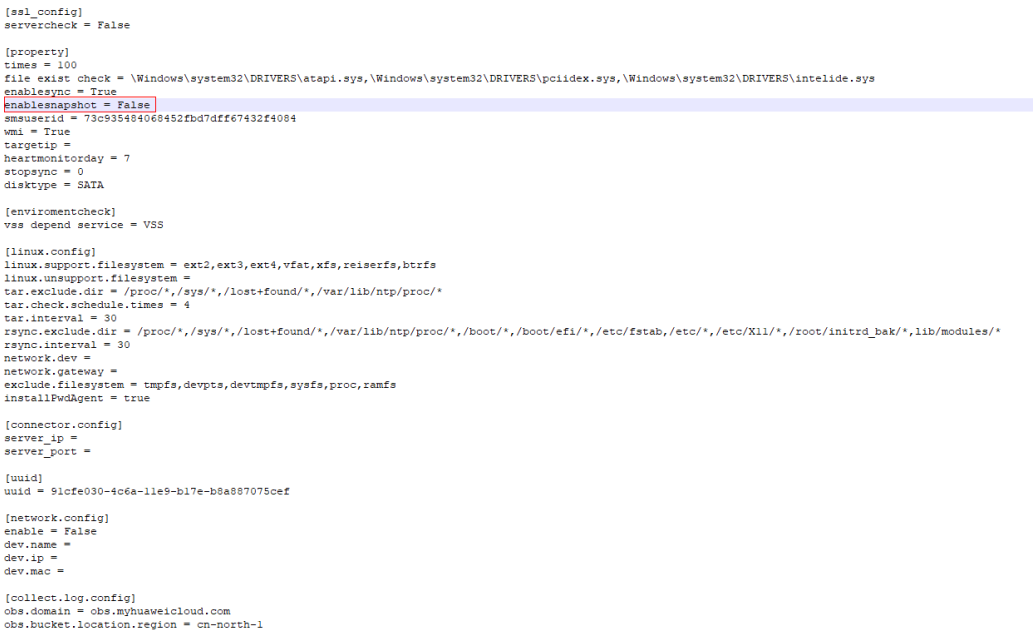
  C:\SMS-Agent-Py3\config.
- Agent (Python 2)

  C:\SMS-Agent-Py2\config

Step 2 Open the **g-property.cfg** file and change the value of **enablesnapshot** to **False**.

Restart the migration task. In this way, the migration task skips snapshot creation.

Figure 4-15 Modifying the configuration parameter



```
[ssl_config]
servercheck = False

[property]
times = 100
file exist check = \Windows\system32\DRIVERS\atapi.sys,\Windows\system32\DRIVERS\pciidex.sys,\Windows\system32\DRIVERS\intelide.sys
enablesync = True
enablesnapshot = False
smsuserid = 73c935484068452fbd7dff67432f4084
wmi = True
targetip =
heartmonitorday = 7
stopsync = 0
disktype = SATA

[enviromentcheck]
vss depend service = VSS

[linux.config]
linux.support.filesystem = ext2,ext3,ext4,vfat,xfs,reiserfs,btrfs
linux.unsupport.filesystem =
tar.exclude.dir = /proc/*,/sys/*,/lost+found/*,/var/lib/ntp/proc/*
tar.check.schedule.times = 4
tar.interval = 30
rsync.exclude.dir = /proc/*,/sys/*,/lost+found/*,/var/lib/ntp/proc/*,/boot/*,/boot/efi/*,/etc/fstab,/etc/*,/etc/X11/*,/root/initrd_bak/*,lib/modules/*
rsync.interval = 30
network.dev =
network.gateway =
exclude.filesystem = tmpfs,devpts,devtmpfs,sysfs,proc,ramfs
installPwdAgent = true

[connector.config]
server_ip =
server_port =

[uuid]
uuid = 91cfe030-4c6a-11e9-b17e-b8a887075cef

[network.config]
enable = False
dev.name =
dev.ip =
dev.mac =

[collect.log.config]
obs.domain = obs.myhuaweicloud.com
obs.bucket.location.region = cn-north-1
```

NOTE

If you skip snapshot creation, data on the target server and the source server may be from different points in time during migration, and services on the target server may fail to be started. If this happens, you can stop the software on the source server when no services are running, and then perform a new data synchronization to ensure that the data on the source and target servers is from the same point in time.

----End

4.6.9 How Do I Fix Error "Failed to mount partition xxx to directory xxx"?

Symptom

During a Linux file-level migration, the migration failed, and you received message "SMS.3205 Failed to mount partition /dev/vdc1 to directory /mnt/vdc1."

Possible Causes

There is a file system on the source server not supported by SMS.

Solution

Currently, SMS supports Ext2, Ext3, Ext4, XFS, VFAT, and Btrfs files systems for Linux.

For unsupported file systems such as ReiserFS, you can copy files to other file systems, uninstall the unsupported file systems, and then perform the migration.

If this is not possible on the source server, you can:

- Use IMS to create a system disk image for the source server from an external image file and use the image to create a server on the cloud platform.
- Use a public or Marketplace image to create a server and deploy your applications on the server.

4.6.10 How Do I Troubleshoot a Failed Migration or Synchronization of a Partition?

Symptom

During the migration, the system reported the message "SMS.0805 Failed to migrate partition xxx to target server xxx" or "SMS.0806 Failed to synchronize partition xxx to target server xxx."

Possible Causes

Possible causes are as follows:

- The network connection linking the source server to the target server is disconnected.
- There is not enough space on the paired partition of the target server.
- The disk is detached from the target server.
- The **/etc/ssh/ssh_config** file is incorrectly configured on the source server.
- The TAR processes exited.

Solutions

1. Check whether the fault was caused by a network disconnection. If it was, rectify the network fault by referring to **How Do I Resolve the Error "Failed to establish an SSH connection with the target ECS"?**
2. Check whether there is enough space on the target partition.

   If there is not enough space, delete any unnecessary files from the partition on the target server or the source server, make sure there is enough space, and try again.
3. Check whether the corresponding target server disk is detached.

   If it is, attach the disk to the target server and try again. Log in to the SMS console, choose **Servers** in the navigation pane on the left, locate the source server, and click **Start** in the **Operation** column.
4. Check whether errors similar to **/etc/ssh/ssh_config: line 69: Bad configuration option: clientactiveinterval** are recorded in the **/root/f2f_migrate_error.log** file.

   If yes, the **ssh_config** is incorrectly configured. Correct the configuration and try again.
5. Check whether there are ongoing tar processes on the source or target server.

   If there are not, tar was terminated. Restart the program. Log in to the SMS console, choose **Servers** in the navigation pane on the left, locate the source server, and click **Start** in the **Operation** column.

4.6.11 How Do I Fix Error "Failed to create a file on the source server. Cause: /bin/sh: line 0: echo: write error: No space left on device"?

Symptom

During the migration of your Linux source server, on the SMS console, you received message "SMS.1204 Failed to create a file on the source server. Cause: /bin/sh: line 0: echo: write error: No space left on device."

Possible Causes

There is not enough space left on the source server. There is no space available for creating new files.

Solution

1. Check the usage of each disk partition on the source server using **df -Th**.

2. If the available space on each partition is less than 1 GB, clear up more disk space or expand the capacity.

3. Delete the record corresponding to this source server from the SMS console. Restart the Agent installed on the source server and perform the migration again.

4.6.12 How Do I Fix Error "Failed to read /etc/fstab on the source server"?

Symptom

When the target server was being launched, you got error message "SMS.3104 Failed to read /etc/fstab on the source server."

Possible Causes

The source server does not have the **fstab** file. If this is the case, an error is reported when the system attempts to read the file during configuration modification.

Solution

1. Log in to the source server and restore the **/etc/fstab** file.
2. Log in to the SMS console and choose **Servers** in the navigation pane on the left.
3. Locate the source server and click **Start** in the **Operation** to start the migration again.

4.6.13 How Do I Resolve Error "Insufficient disks on the Target ECS"?

Symptom

When you configure or launch the target server, you got a message "SMS.1311 Insufficient disks on the Target ECS."

Possible Causes

- When configuring the target server, SMS checks whether the target server has the same number of disks as the source server. If you receive this error, check whether the number of disks on the target server is less than that on the source server, or whether any disks on the target server have been manually deleted or detached. If this is the case, perform the operations described in **Solution for Inconsistent Number of Disks Between the Source and Target Servers** .
- After the Agent is started, any disk additions or deletions on the source server will make the Agent fail to identify the disk changes. If this is the case, perform the operations described in **Solution for Disk Additions or Deletions on the Source Server**.

Solution for Inconsistent Number of Disks Between the Source and Target Servers

Step 1 Click **Service List**. Under **Migration**, click **Server Migration Service**.

Step 2 The SMS console is displayed.

Step 3 In the navigation pane on the left, choose **Servers**.

Step 4 The server list is displayed.

Step 5 Locate the source server and choose **More** > **Delete Target Configuration**.

Step 6 Attach disks to the target server to ensure that the target server has at least as many disks as the source server.

Step 7 Go back to SMS console, locate the source server in the server list, and click **Configure** in the **Target** column to configure the target server. Then perform the migration again.

----End

Solution for Disk Additions or Deletions on the Source Server

Step 1 Click **Service List**. Under **Migration**, click **Server Migration Service**.

The SMS console is displayed.

Step 2 In the navigation pane on the left, choose **Servers**.

The server list is displayed.

Step 3 Locate the source server, choose **More** > **Delete This Server**.

Step 4 Attach disks to the target server to ensure that the target server has at least as many disks as the source server.

Step 5 Go back to SMS console, locate the source server in the server list, and click **Configure** in the **Target** column to configure the target server. Then perform the migration again.

----End

4.6.14 How Do I Resolve Error "SMS.1105 Disk creation failed"?

Symptom

During the creation of a target server, message "SMS.1105 Disk creation failed" was displayed.

Possible Causes

To prevent unforeseen spikes in resource usage, quotas can limit the number or amount of resources available to users, such as the number of EVS disks, the capacity of EVS disks, and the number of EVS snapshots.

Solution

Increase the EVS disk quantity quota and try again.

4.6.15 How Do I Resolve Error "Failed to execute df -TH"?

Symptom

When you started the Linux Agent by running the startup.sh script, error "Failed to execute df -TH" was reported.

Possible Causes

After you run **df -TH** and **echo $?** on the source server, if the command output is not **0**, the command execution failed.

In this case, it is possible that a mounted device is offline or does not exist.

Solution

Unmount the device. Run **df -TH** and **echo $?** and check whether the output is **0**.

4.6.16 What Are the Requirements on Disks on a Target Server?

SMS requires that:

1. There must be at least as many disks on the target server as you specified during partition resizing.
2. Every disk on the target server must be larger than their pair on the source server.

For details about how to resize disks and partitions, see **Configuring a Target Server**.

4.6.17 How Can I Migrate a Source Server with a Large System Disk?

Windows

- If a source system disk is too large, and the total size of the system and boot partitions is greater than 1 TB, SMS cannot migrate such a source server.
- If a source disk is larger than 1 TB, but the total size of the system and boot partitions is less than 1 TB, you can modify the Agent configuration file to perform the migration successfully.

  For example, if the source system disk is 1.1 TB, with 100 GB for the system and boot partitions and 1,024 GB for the data disk (D:), you can prepare a 100 GB and a 1,024 GB disk on the target server for receiving data from the source system disk.

CAUTION

The system and boot partitions on the source server can only be migrated to the first disk on the target server.

You can view the total size of these two partitions using Disk Management in Windows.

Procedure

a. Go to the Agent configuration directory on the source server.

   - Agent (Python 3)

     C:\SMS-Agent-Py3\config

   - Agent (Python 2)

     C:\SMS-Agent-Py2\config

b. Modify the **disk.cfg** file as follows and save it.

```
[volmap]
D = 2
```

   NOTE

   1. **D = 2** indicates that data in disk D will be migrated to the second disk on the target server.
   2. There are multiple partitions on the source server, and you want to migrate them to different disks on the target server. In this case, modify the **disk.cfg** file in the same way, such as D=2, E=3, F=4.

c. Restart the Agent. You will see that the partition locations have been changed.

Linux

If a source disk is too large, you can perform a file-level migration and resize the disk partitions. For details about partition resizing rules, see **Configuring a Target Server**. If this method does not work, contact technical support.

4.6.18 How Do I Resolve Error "Some disks on the target server are smaller than those on the source server. Select another target server" When I Configure the Target Server?

Symptom

When you clicked **Next: Confirm** after you select an existing ECS as the target server, message "Some disks on the target server are smaller than those on the source server. Select another target server" was displayed.

Possible Causes

When you configure a target server, ensure that the following requirements are met:

- The target server must have at least as many disks as the source server.
- Each disk on the target server must be at least as large as the paired disk on the source server.

If the requirements are not met, the preceding message will be displayed.

Solution

Step 1 Locate any target server disks that do not meet the second requirement, and expand these disks on the ECS console to be at least as large as their paired source server disks.

You can expand the target server disks based on the recommended disk sizes on the **Configure Target** page of the SMS console.

If the second requirement can be met by adjusting the disk mounting sequence, perform the following steps:

1. Go to the ECS console and stop the target server.
2. Detach all of the disks from the target server.
3. Attach these disks back to the target server based on the recommended disk sequence displayed on the **Configure Target** page of the SMS console.

Step 2 Switch to the SMS console and select the target server you just configured.

----End

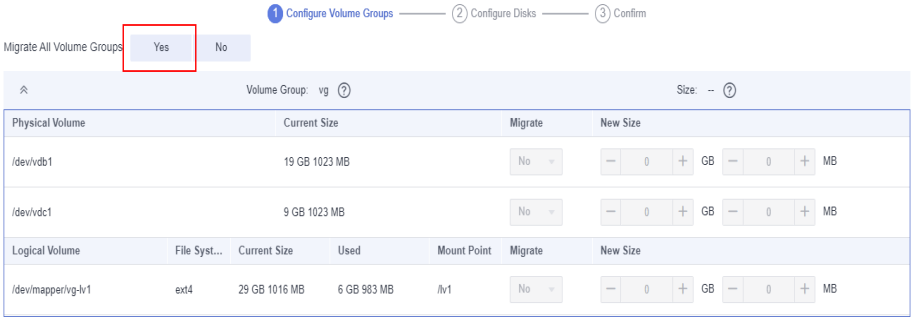
4.6.19 Can SMS Migrate Local Disks on a Source Server?

SMS does not migrate local disks on source servers. You are advised to replace the local disks with EVS disks.

4.6.20 Why Can't I Specify Whether to Migrate a Physical Volume When I Resize Disk Partitions in Linux?

- Case 1: **Migrate** is set to **No** and cannot be modified for a physical volume.

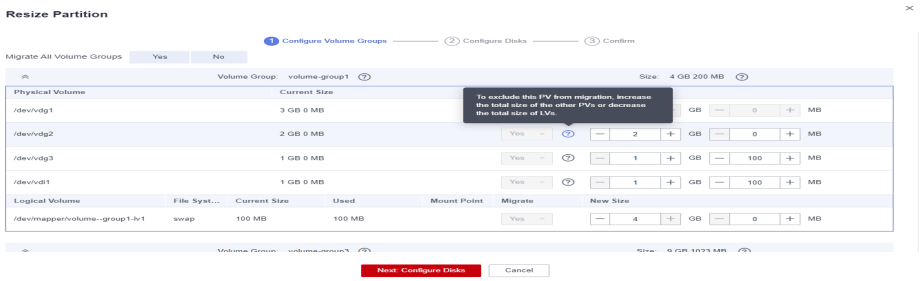
  If none of the logical volumes in a volume group are migrated, their physical volumes are not migrated by default. If you want to change the settings, select **Yes** for **Migrate All Volume Groups** and try again.



- Case 2: **Migrate** is set to **Yes** and cannot be modified for a logical volume.

  If there are physical volumes that do not need to be migrated, increase the total size of the other physical volumes or decrease the total size of logical volumes, to ensure that the total size of physical volumes is larger than that of logical volumes.

  For details about partition resizing rules, see **What Are the Rules for Resizing Volume Groups, Disks, and Partitions?**



- Case 3: In a Linux block-level migration, you can choose to migrate either all or none of the volume groups.

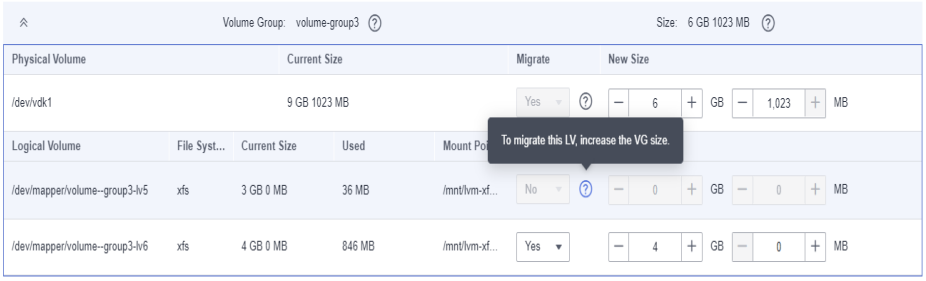
  For a block-level migration of a Linux server using LVM, physical volumes and logical volumes cannot be resized.

4.6.21 Why Can't I Specify Whether to Migrate a Logical Volume When I Resize Disk Partitions in Linux?

- Case 1: Logical volumes without mount points are migrated by default.
- Case 2: **Migrate** is set to **No** and cannot be modified for a logical volume.

  To migrate this logical volume, increase the volume group size to ensure that it is larger than the total logical volume size.

  For details about partition resizing rules, see **What Are the Rules for Resizing Volume Groups, Disks, and Partitions?**



- Case 3: In a Linux block-level migration, you can choose to migrate either all or none of the volume groups.

  For a block-level migration of a Linux server using LVM, physical volumes and logical volumes cannot be resized.

4.6.22 What Are the Rules for Resizing Volume Groups, Disks, and Partitions?

Table 4-12 Rules for resizing disks and partitions in Windows

Item	Minimum Size	Maximum Size
Disk	• System disk (The larger value is used.) – Total partition size after resizing – 40 GB • Data disk (The larger value is used.) – Total partition size after resizing – 10 GB	• System disk: 1,024 GB • Data disk: 32,768 GB
Disk partition	The smaller value is used. • Used space + 1 GB • Size before resizing	Disk size after resizing – Total size of the other partitions on the disk

Table 4-13 Rules for resizing volumes, disks, and partitions in Linux

Scenario	Item	Minimum Size	Maximum Size
LVM	Logical volume (LV)	The smaller value is used. • Used space + 1 GB • Size before resizing	VG size after resizing – Size of the other LVs in the VG

Scenario	Item	Minimum Size	Maximum Size
	Physical volume (PV) - disk	The larger value is used. • 10 GB • Total size of LVs in the VG – Total size of the other PVs in the VG	32,768 GB
	Physical volume (PV) - partition	The larger value is used. • 1 GB • Total size of LVs in the VG – Total size of the other PVs in the VG	Disk size after resizing – Total size of the other partitions on the disk
Non-LVM	Disk	• System disk (The larger value is used.) – Total partition size after resizing – 40 GB • Data disk: 10 GB	• System disk: 1,024 GB • Data disk: 32,768 GB
	Partition	The smaller value is used. • Used space + 1 GB • Size before resizing	Disk size after resizing – Total size of the other partitions on the disk

4.6.23 How Do I Migrate a Server with a System Disk Larger Than 1 TB?

Background

SMS is restricted by an IMS limitation on the system disk size. When you use an image to create an ECS, the system disk cannot be larger than 1 TB. If the system disk of the source server to be migrated is larger than 1 TB, the migration can only be performed when certain conditions are met and the disk is resized.

Linux File-Level Migration

If the source system disk is larger than 1 TB but the disk usage is low, less than I TB of space used, you can resize the system disk and system partition of the target server before migration.

Step 1 Install the Agent on the source server. For more information, see "Installing the Agent".

Step 2 Start the Agent. After the Agent is started, configure a target server by referring to **Configuring a Target Server**. When you configure the basic settings, select **Yes** for **Partition Resize** to resize the disks and partitions of the target server.

Step 3 In the **Resize Partition** window, set a new size for the system disk and partition as needed.

Step 4 Click **Next: Configure Target** to complete the migration configuration and start the migration.

----End

Windows Migration

See **How Do I Resize Partitions and Disks on a Target Server Running Windows Before the Migration?**

4.6.24 How Do I Detach the Temporary System Disk from My Target Server and Re-attach the Original Disk?

Symptom

After you deleted a failed or suspended migration task from the SMS console, the target server was still using the temporary system disk, whose name starts with SMS. As a result, the original system disk could not be re-attached.

Possible Causes

If a migration task fails or is suspended, the system will not automatically detach the temporary system disk and re-attach the original system disk. If you want to restore this server to its original condition, you need to perform this step manually.

Solution

Step 1 Detach the temporary system disk.

1. Log in to the ECS console.
2. In the server list, locate this server and click its name.
3. Click the **Disks** tab, locate disk **SMS-Temp_Disk_Deleted-after-migration**, and click **Detach**.
4. Click **Yes**.

Step 2 Detach the original system disk.

NOTE

The original system disk is attached as a data disk. You need to detach it and attach it as a system disk again.

1. Detach the original system disk from the target server by referring to step 1.
2. Log in to the EVS console. In the disk list, locate the disk you detached and click the disk name.

   Check whether the disk has changed from a data disk to a system disk. If it has, go to the next step.

----End

4.6.25 Why Is There Less Data on the Target Server After the Migration Than There Was on the Source Server?

Symptom

After the migration was complete, the amount of migrated data was less than the total amount of data scanned on the source server.

Possible Causes

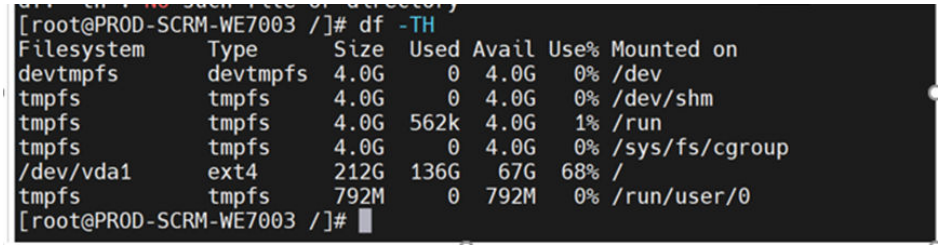
The total amount of data to be migrated on the source server is collected by the Agent through the **df-Th** command. The amount of migrated data is the total combined size of all the migrated files.

If these two amounts are different, the possible causes are as follows:

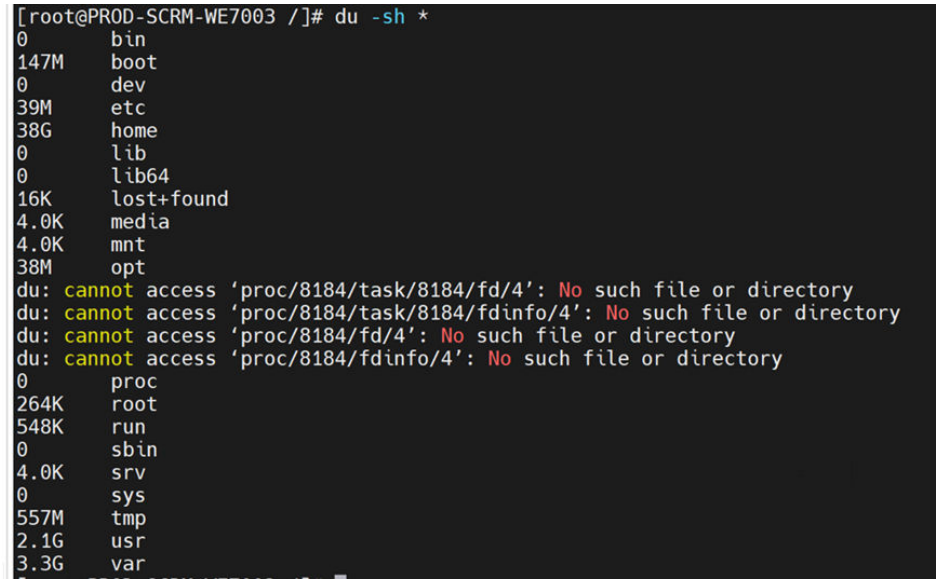
- **Possible cause 1: Some files were deleted from the source server, but the processes using these file still exist.**

  The **rm** command or other software is often used to delete files. If a file is used by a running process when it is deleted, it will still be accessible to this process and will continue to occupy disk space.

  a. On the source server, run **df -Th** to check whether the used disk space is the same as the total amount of migrated data.

  
  ```
  [root@PROD-SCRM-WE7003 /]# df -TH
  Filesystem     Type      Size  Used Avail Use% Mounted on
  devtmpfs       devtmpfs  4.0G     0  4.0G   0% /dev
  tmpfs          tmpfs     4.0G     0  4.0G   0% /dev/shm
  tmpfs          tmpfs     4.0G  562k  4.0G   1% /run
  tmpfs          tmpfs     4.0G     0  4.0G   0% /sys/fs/cgroup
  /dev/vda1      ext4      212G  136G   67G  68% /
  tmpfs          tmpfs     792M     0  792M   0% /run/user/0
  [root@PROD-SCRM-WE7003 /]#
  ```

  b. In the root directory of the source server, run **du -sh *** to check the disk usage of directories.

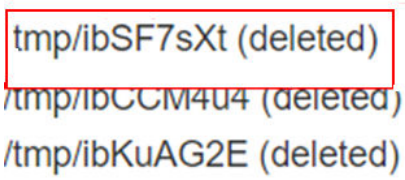
  
  ```
  [root@PROD-SCRM-WE7003 /]# du -sh *
  0       bin
  147M    boot
  0       dev
  39M     etc
  38G     home
  0       lib
  0       lib64
  16K     lost+found
  4.0K    media
  4.0K    mnt
  38M     opt
  du: cannot access ‘proc/8184/task/8184/fd/4’: No such file or directory
  du: cannot access ‘proc/8184/task/8184/fdinfo/4’: No such file or directory
  du: cannot access ‘proc/8184/fd/4’: No such file or directory
  du: cannot access ‘proc/8184/fdinfo/4’: No such file or directory
  0       proc
  264K    root
  548K    run
  0       sbin
  4.0K    srv
  0       sys
  557M    tmp
  2.1G    usr
  3.3G    var
  ```

  In the above figures, **df** reports a larger data volume than **du**.

c. Run the following command on the source server:

```
lsof -n / |grep deleted
```

If information similar to the following is displayed, some files were deleted but are still in use by some running processes.



- If the migration task can be finished and the target server can be launched, the data unmigrated has no effects on the target server, and this problem can be ignored.
- (Optional) On the source server, run **lsof -n / |grep deleted** and stop all the processes returned.
- (Optional) Restart the source server at an appropriate time to stop the processes.

- **Possible cause 2: Some directories were excluded from migration.**

  In Linux, the Agent does not migrate files in the following directories by default:

  /proc/*

  /sys/*

  /lost+found/*

  /var/lib/ntp/proc/*

  But these directories are counted in the total volume of source data scanned by the Agent.

  In the root directory of the source server, run **du -sh *** to check how much space is occupied by directories that were not migrated, such as **/proc/***, **/sys/***, **/lost+found/***, and **/var/lib/ntp/proc/***.

  If the total size of these excluded directories equals to the size of unmigrated data, the migration is successful, and this problem can be ignored.

- **Possible cause 3: There were data changes on the source server during the migration.**

  When a migration starts, the Agent runs the **df -Th** command to obtain information about directories where each partition is mounted and traverses these directories to calculate the amount of data to be migrated.

  Data that has already been migrated is not affected by changes to the source data. However, if data that has not been migrated changes, the most current version is what migrated.

  The amount of data displayed on the SMS console reflects information collected from the source server during the first scan. During the migration, if a large amount of data is changed on the source server, for example, a large amount of data is deleted before being migrated, the amount of data migrated may be less than the total amount of data scanned for the first time.

  You can run **df -Th** on the source and target servers for comparison.

- **Possible cause 4: A large number of sparse files existed on the source server.**

  Sparse files are scanned but ignored during the migration. This may lead to the amount of migrated data less than the total amount of data calculated during the first scan.

  NOTE

  There are many ways to generate sparse files in Linux, such as running the **dd** command.

4.6.26 How Do I Merge Disks During a Linux Migration?

Scenario

When you migrate a Linux server, you can migrate partitions from different disks on the source server to a single disk on the target server.

Solution

Modify the SMS-Agent configuration file on the source server.

NOTICE

- The modified configuration file will only be used for the target server. It will not affect the source server.
- The migration progress bar on the SMS console may not be able to show the real-time progress after you modify the configuration file.

Step 1 On the source server, go to the **config** directory in the Agent installation directory.

```
cd SMS-Agent/agent/config
```

Step 2 Open and edit the **disk.cfg** configuration file in **config**.

```
vi disk.cfg
```

Step 3 Modify parameters under **vol_disk_modify**.

- **vol_name**: Enter the names of the original partitions.
- **new_vol_name**: Enter the names of the new partitions.
- **disk_name**: Enter the names of disks where the source partitions are located.
- **new_disk_name**: Enter the names of target disks.

In this example, we will migrate the **vdc1** partition on the **vdc** disk and the **vdd1** partition on the **vdd** disk of the source server to the **vdb4** and **vdb5** partitions on the **vdb** disk of the target server.

```
[vol_disk_modify]
vol_name=/dev/vdc1;/dev/vdd1
new_vol_name=/dev/vdb4;/dev/vdb5
disk_name=/dev/vdc;/dev/vdd
new_disk_name=/dev/vdb;/dev/vdb
```

CAUTION

- Use semicolons (;) to separate disk or partition names. Make sure that the same number of values configured for each of the above four parameters.
- Make sure the target disk is larger than the total size of all the partitions on it, or the migration may fail. If you need to resize the target disk or add a new disk, see **Resizing Disks** and **Adding Disks**.
- Make sure that you follow the right naming format of "Disk name+Partition number", for example, vdb4. The new partition name must be unique.
- Neither LVM nor Btrfs partitions can be merged.

Step 4 Save settings in the **disk.cfg** configuration file and restart the Agent.

```
:wq
```

----End

Resizing Disks

You can resize target disks by modifying the **disk_size_modify** parameter in the **disk.cfg** configuration file.

- **disk_name**: Enter the names of target disks.
- **adjust_size**: Enter the new disk sizes.

In the following example, we will change the size of the target disk **vdb** to 40 GB.

```
[disk_size_modify]
disk_name=/dev/vdb
adjust_size=40G
```

CAUTION

- For a system disk, its size must range from 40 GB to 1024 GB.
- For a data disk, its size must range from 40 GB to 32,768 GB.

Adding Disks

You can add disks by modifying the **disk_add** parameter in the **disk.cfg** configuration file.

- **disk_name**: Enter the names of new disks.
- **adjust_size**: Enter the sizes of new disks, in GB.

In the following example, we will add a 10 GB disk called **vdd** to a target server.

```
[disk_add]
disk_name=/dev/vdd
disk_size=10G
```

CAUTION

- The disk name must comply with the naming rules and must be unique.
- The disk size must range from 10 GB to 32,768 GB.

4.6.27 How Do I Split a Disk During a Linux Migration?

Scenario

When you migrate a Linux server, you can migrate partitions from a disk on the source server to different disks on the target server.

If you need to reduce the size of a partition or disk on the target server, you can resize the partition or disk when creating a task on the SMS console after the SMS-Agent is started.

Solution

Modify the SMS-Agent configuration file on the source server.

NOTICE

- The modified configuration file will only be used for the target server. It will not affect the source server.
- The migration progress bar on the SMS console may not be able to show the real-time progress after you modify the configuration file.

Splitting by Partition

You can split a partition by modifying the partition mapping.

Step 1 On the source server, go to the **config** directory in the Agent installation directory.

```
cd SMS-Agent/agent/config
```

Step 2 Open and edit the **disk.cfg** configuration file in **config**.

```
vi disk.cfg
```

Step 3 Modify parameters under **vol_disk_modify**.

- **vol_name**: Enter the names of the original partitions.
- **new_vol_name**: Enter the names of the new partitions.
- **disk_name**: Enter the names of disks where the source partitions are located.
- **new_disk_name**: Enter the names of target disks where the new partitions are located.

In this example, we will migrate the **vda2** and **vda3** partitions from the source disk **vda** to the target disks **vdb** and **vdc**.

```
[vol_disk_modify]
vol_name=/dev/vda2;/dev/vda3
new_vol_name=/dev/vdb2;/dev/vdc2
```

```
disk_name=/dev/vda;/dev/vda
new_disk_name=/dev/vdb;/dev/vdc
```

CAUTION

- Use semicolons (;) to separate disk or partition names. Make sure that the same number of values configured for each of the above four parameters.
- Make sure that the available space on the target server can accommodate the new partitions, or the migration may fail. To adjust the size, see **Resizing Disks** or **Adding Disks**.
- Make sure that you follow the right naming format of "Disk name+Partition number", for example, vdb4. The new partition name must be unique.

Step 4 Save settings in the **disk.cfg** configuration file and restart the Agent.

```
:wq
```

----End

Resizing Disks

You can resize target disks by modifying the **disk_size_modify** parameter in the **disk.cfg** configuration file.

- **disk_name**: Enter the names of target disks.
- **adjust_size**: Enter the new disk sizes.

In the following example, we will change the size of the target disk **vdb** to 40 GB.

```
[disk_size_modify]
disk_name=/dev/vdb
adjust_size=40G
```

CAUTION

- If the target disk is a system disk, its size range must be from 40 GB to 1024 GB.
- If the target disk is a data disk, its size range must be from 40 GB to 32,768 GB.

Adding Disks

You can add disks by modifying the **disk_add** parameter in the **disk.cfg** configuration file.

- **disk_name**: Enter the names of new disks.
- **adjust_size**: Enter the sizes of new disks, in GB.

In the following example, we will add a 10 GB disk called **vdd** to a target server.

```
[disk_add]
disk_name=/dev/vdd
disk_size=10G
```

CAUTION

- The disk name must comply with the naming rules and must be unique.
- The disk size range must be from 10 GB to 32,768 GB.

4.7 Migration or Synchronization Failures

4.7.1 After the Migration Is Complete, How Do I Replicate Any New Data from the Source Server to the Target Server?

To synchronize the incremental source data to the target server during migration, click **Synchronize** in the **Operation** column of the task after the migration is complete.

4.7.2 How Do I Fix the Error "The migration module stops abnormally and cannot synchronize data"?

Symptom

The message "The migration module stops abnormally and cannot synchronize data" is displayed during the continuous synchronization.

Possible Causes

The Agent or the source server has been restarted.

NOTE

On the source server, there is a process that monitors disk changes and synchronizes the incremental data from the source server to the target server. If the source server is restarted, this process is stopped, and the incremental synchronization cannot be performed.

Solution

In this case, the migration task cannot continue. Delete the task and create a migration task for the source server again. To prevent this issue from happening, take care to avoid restarting the source server or Agent during migration.

4.7.3 What Do I Do If the SMS-Agent Exits Suddenly and Disconnects a Windows Source Server from the SMS Console During a Migration?

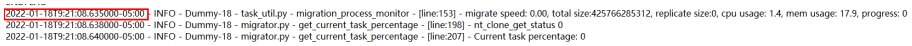
Symptom

During the migration of a Windows server, the source server was suddenly disconnected from the SMS console. It was found that the SMS-Agent program exited on the source server.

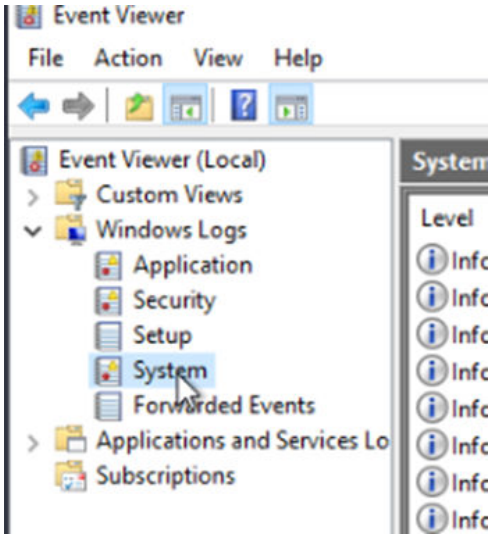
Possible Causes

The SMS-Agent program may exit if the Customer Experience Improvement Program is turned on on the source server.

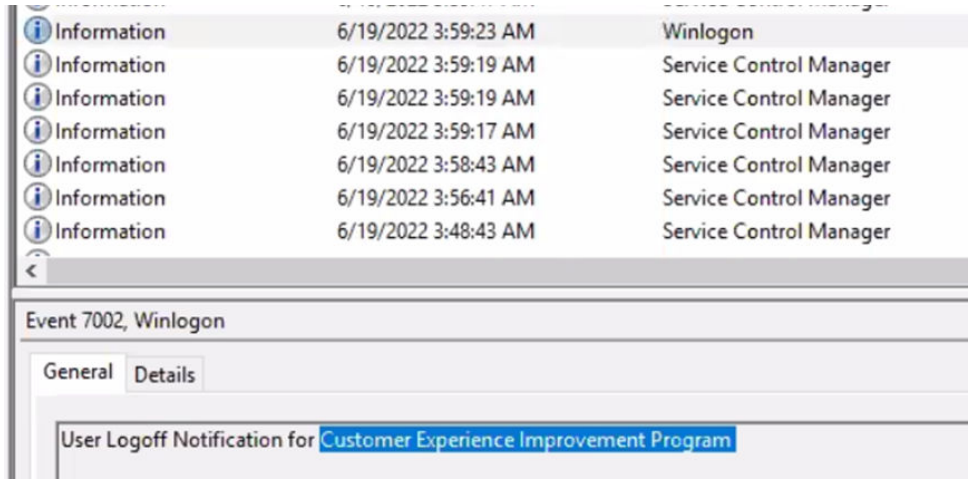
1. Check the disconnection time in the SMS-Agent migration logs stored in **C:\SMS-Agent-Py3\SmsAgent_Info.log**.



2. On the source server, open **Event Viewer** > **Windows Logs** > **System**.



3. In the system logs, check the log generated at the SMS-Agent disconnection time. The log says that the source server was automatically restarted due to a user logout notification for the customer experience improvement program.



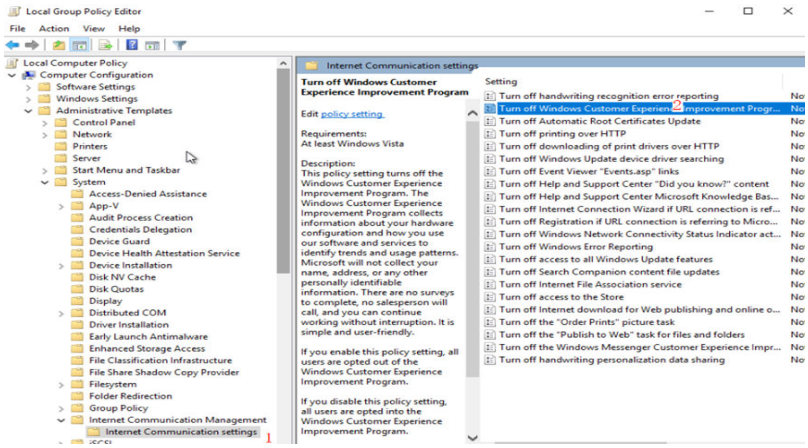
Solution

Turn off the customer experience improvement program.

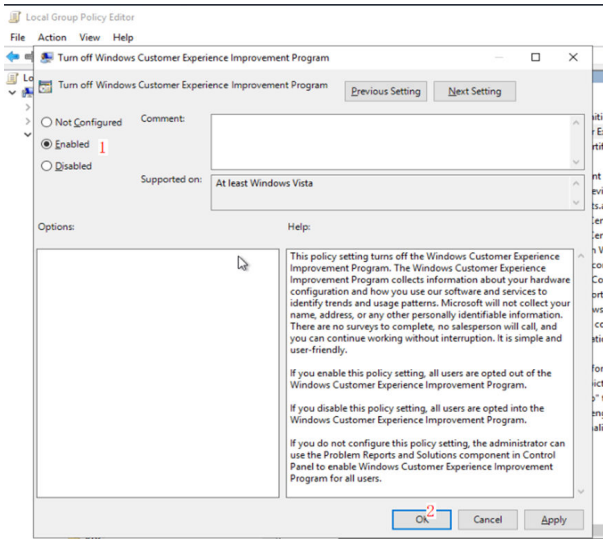
Step 1 On the source server, open the **Run** window, enter **gpedit.msc**, and click **OK**.

Step 2 In the navigation tree, choose **Computer Configuration** > **Administrative Templates** > **System** > **Internet Communication Management** > **Internet**

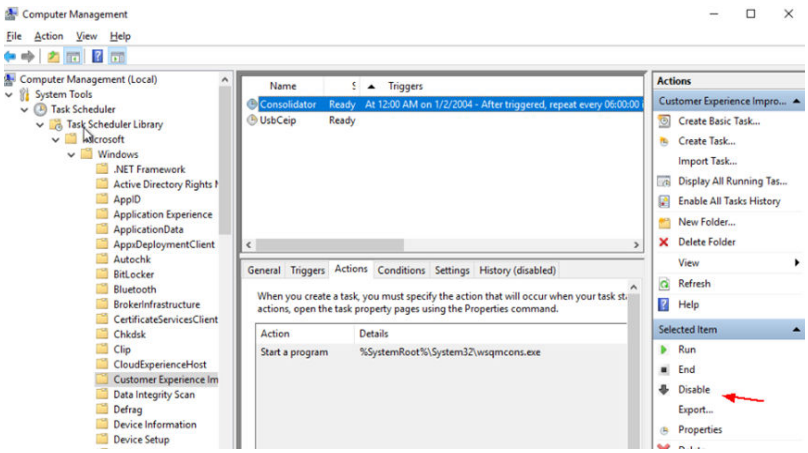
Communication settings, and locate **Turn off Windows Customer Experience Improvement Program**.

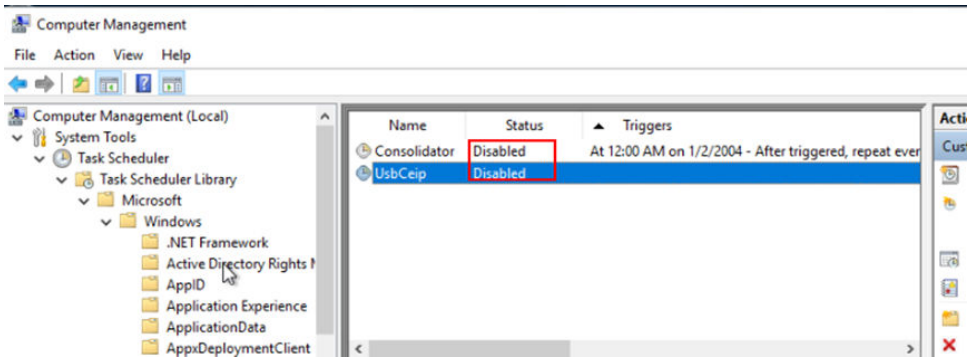


Step 3 Double-click **Turn off Windows Customer Experience Improvement Program**. In the displayed window, select **Enabled** and click **OK**.

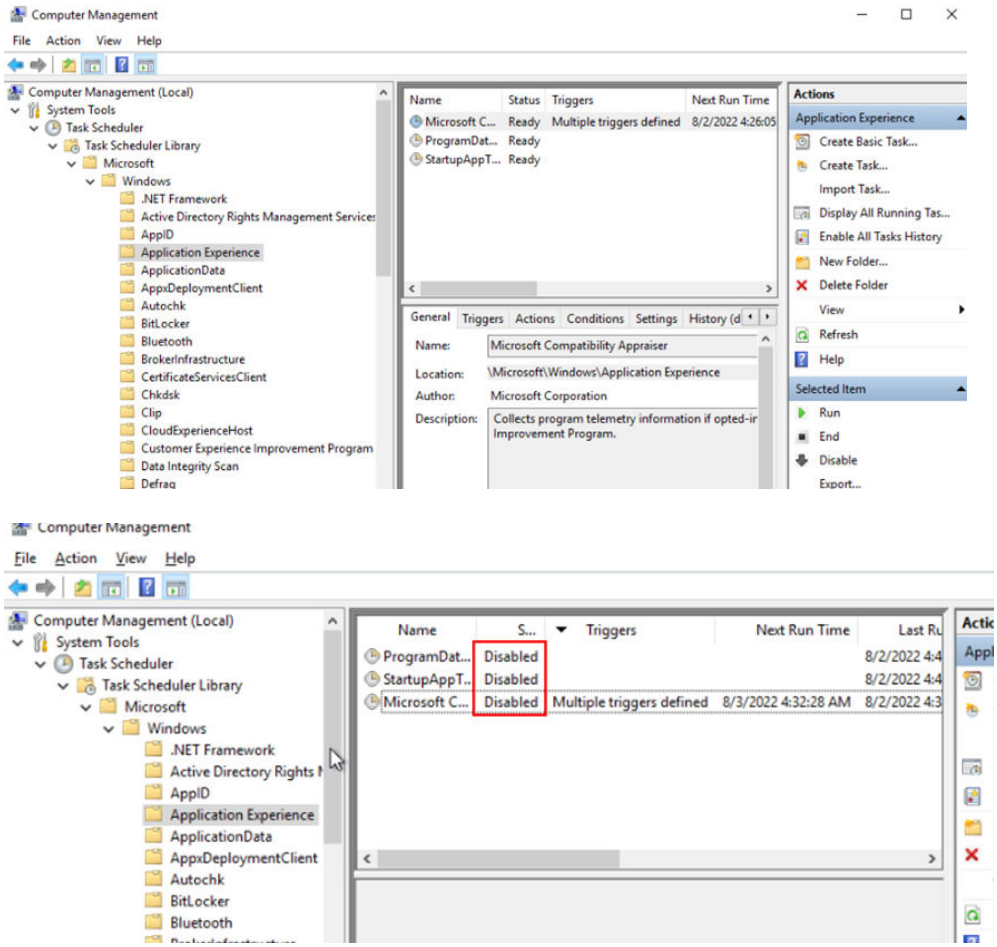


Step 4 Open **Computer Management**. Choose **System Tools** > **Task Scheduler Library** >**Microsoft**>**Windows**>**Customer Experience Improvement Program**, and disable all tasks.





Step 5 Choose **System Tools** > **Task Scheduler Library** > **Microsoft** > **Windows** > **Application Experience**, and disable all tasks.



Step 6 Delete the migration task on the SMS console, create a task for the source server again, and start the migration task.

----End

4.8 Target Server Configuration and Launch

4.8.1 What Are the Differences Between Target and Source Servers After the Migration?

Table 4-14 Differences between target and source servers after the migration

Item	Can Be Changed	After Migration	Remarks
Security Identifier (SID)	Yes	The SID of the target server is used.	In Windows, a SID is a unique, immutable identifier for a server in a given domain. If the source server is added to a domain, the SID will become invalid on the target server. You need to add the target server to the domain again.
Host name	Possibly	The host name may be changed.	Services bound to the host name may be affected.
OS type	No	The target server runs the same type of OS as the source server.	The original OS of the target server is overwritten.
MAC address	Yes	The MAC address of the target server is used.	A MAC address is a unique identifier assigned to a NIC when a target server is created.
NIC name	Possibly	The names of NICs on the target server are determined by the NIC configuration files migrated from the source server.	You can modify the NIC names after the migration, or your services may be affected.
IP address	Yes	The IP addresses of the target server are used.	The target server uses its original public IP address. If the private IP address of the source server is included in the network segment of the VPC to which the target server belongs, the private IP address can remain unchanged.

Item	Can Be Changed	After Migration	Remarks
DNS	The DNS settings are probably changed on the target server.	The DNS settings may be changed on the target server.	After the migration is complete, you can modify the DNS settings for the target server.
Disk name	Possibly	New disk names are generated based on the virtualization type of the target server.	Services are not affected.
Username	No	The target server uses the same username as the source server.	None
Password/ Certificate	No	The target server uses the same username, certificate, and password as the source server.	None
Registry and startup items	Yes	The registry and BCD file are modified as needed.	SMS modifies the registry and startup items to adapt to the cloud platform.
Other data	No	Other data, including files, applications, and configurations, are consistent with those on the source server.	None

4.8.2 How Will the Authentication of a Target Server Change?

The changes to the authentication of a target server are as follows:

- For a completed migration, the target server uses the same login credentials as the source server. Any usernames, certificates, and passwords will remain unchanged.
- For an ongoing Linux migration, the login credentials of the target server depend on the option you choose when you configure the target server.
  - If **Use existing** is selected, the target server uses its original login credentials.
  - If **Create during migration** is selected, the login credential of the target server is **1***First eight characters of the SK of the target account***!**.

4.8.3 How Do I Optimize a Windows Target Server After the Migration Is Complete?

Scenarios

After the migration is complete, you need to manually install drivers on the target server to solve compatibility issues.

Procedure

1. Log in to the management console.
2. Under **Compute**, click **Elastic Cloud Server**.
3. In the ECS list, view the flavor of the target ECS.

   ECS flavors are named in the "AB.C.D" format, for example, m2.8xlarge.8.

   A specifies the ECS type. **B** specifies the type ID. **C** specifies the flavor size. **D** specifies the ratio of memory to vCPUs expressed in a digit.
   - If **B** of the target ECS is 1, for example, s1.small.2, the ECS uses Xen virtualization, and you will need to install the PV driver.
   - If **B** of your target ECS is not 1, for example, s2.small.3, the ECS uses KVM virtualization, and you will need to install UVP VMTools.
4. Check whether there is a PV driver or UVP VMTools software package on the target ECS based on the virtualization type queried in **3**.
   - If there is, go to **7**.
   - If there is not, go to **6**.
5. Download the PV driver or UVP VMTools software package to the source server based on the virtualization type queried in **3**. For more information, see **Obtaining Required Software Packages** in "Optimizing a Windows Private Image (Windows)" of *Image Management Service User Guide*.
6. Synchronize the PV driver or UVP VMTools software package from the source server to the target ECS, and then go to **7**.
7. Install the required driver on the target ECS.
   a. For more information, see "Optimizing a Windows Private Image" > "Installing UVP VMTools" in *Image Management Service User Guide*.

b. For more information, see "Optimizing a Windows Private Image" > "Installing the PV Driver" in *Image Management Service User Guide*.

4.8.4 How Do I Fix the Error "SMS.1113 Failed to reconfigure partition details on the target server" When I Launch the Target Server?

Symptom

The target server failed to be launched, and the message "SMS.1113 Failed to reconfigure partition details on the target server" was displayed.

Possible Causes

When the system attempted to obtain the command, the connection timed out due to an unstable network, and the target server could not be launched.

Solution

Ensure that the source bandwidth is sufficient. Pause the migration task and then restart it.

4.8.5 After a Windows Server Was Migrated, Why Is the Used Space of C: Drive Increased?

Symptom

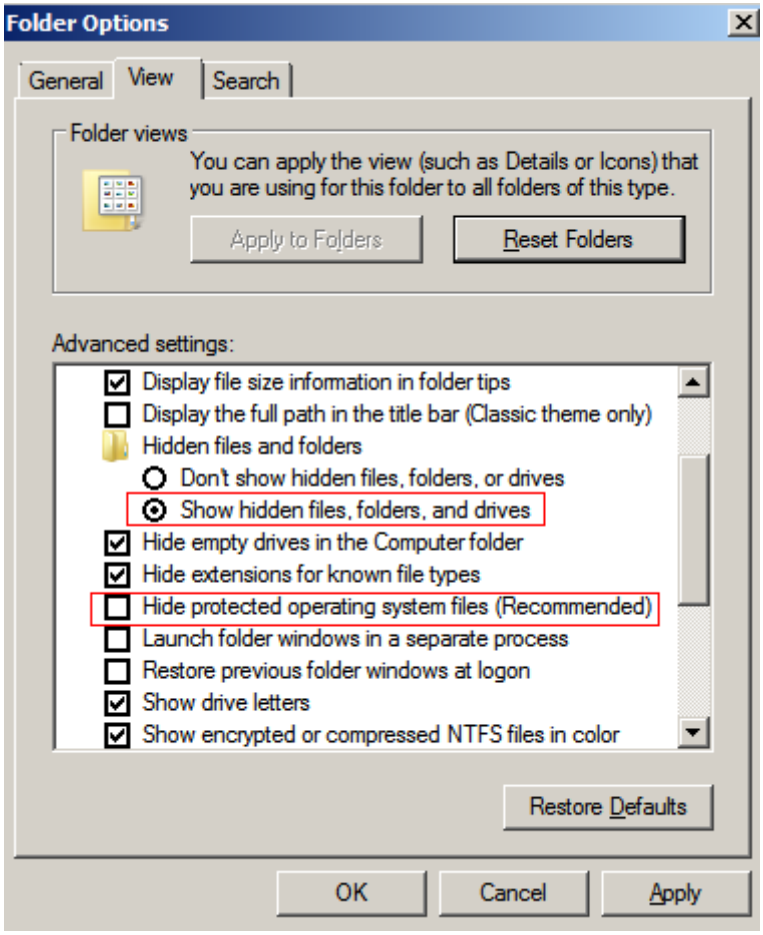
After a Windows server was migrated to the cloud platform, the used space of C: drive increased at least 1 GB.

Problem Analysis

This is a normal because the size of the paging file, used for virtual memory, tends to be larger after the migration is complete.

1. Log in to the source server.
2. Choose **Start** > **Control Panel** > **Folder Options**.

   The **Folder Options** dialog box is displayed.
3. Click the **View** tab. In the **Advanced settings** area, perform the following operations:
   - Deselect **Hide protected operating system files (Recommended)**.
   - Select **Show hidden files, folders, and drives** and click **Apply**.



4. Log in to the target server and repeat **2** and **3**.
5. Compare the size of the virtual memory file **pagefile.sys** in the **Local Disk (C:)** on the source and target servers.

   The **pagefile.sys** file on the target server is larger than that on the source server.

   The size difference of **pagefile.sys** on the two servers should account for the difference in used space.
6. On the target server, click **Start**.
7. Choose **Control Panel** > **System** > **Advanced system settings**.

   The **System Properties** dialog box is displayed.
8. Click the **Advanced** tab, click **Settings** in the **Performance** area.

   The **Performance Options** page is displayed.
9. Click the **Advanced** tab, click **Change** in the **Virtual memory** area.

   The **Virtual Memory** is displayed.

   You can see that the target server uses **Automatically manage paging file size for all drives**. That is, the size of virtual memory file **pagefile.sys** on the target server is equal to the size of file **Installed Memory (RAM)** on the server.

   If the size of file **Installed Memory (RAM)** on the target server is different from that on the source server, the used space of C: drive on the target server is inconsistent with that on the source server.

4.8.6 How Do I Uninstall the SMS-Agent from the Source and Target Servers After the Migration Is Complete?

Symptom

After the migration is complete, you can perform the following operations to uninstall the SMS-Agent.

Windows

- Method 1
  a. Log in to the server where the SMS-Agent is to be uninstalled.
  b. Choose **Start** > **All Programs**.
  c. In the **All Programs** panel, click the **SMS-Agent** folder.
  d. Click **Uninstall** in the **SMS-Agent** file.
  e. In the **SMS-Agent-1.0.0 Uninstall** dialog box, click **Yes**.
- Method 2
  a. Log in to the server where the SMS-Agent is to be uninstalled.
  b. Click **Start**, and then select **Computer**.
  c. Go to the **C:\Program Files (x86)\SMS-Agent** directory.
  d. Double-click **Uninstall.exe**.
  e. In the **SMS-Agent-1.0.0 Uninstall** dialog box, click **Yes**.

Linux

1. Log in to the server where SMS-Agent is to be uninstalled as user **root**.
2. Go to the SMS-Agent installation directory.
3. Stop the SMS-Agent.
   shutdown.sh
4. Go to the upper-level directory.
   cd ..
5. Delete the SMS-Agent installation directory.
   rm -rf SMS-Agent

4.8.7 Why Is the File System Size Inconsistent Before and After the Migration?

Symptom

- After the migration, the used partition space on the target server is different from that on the source server.
- After the migration, a particular file size on the target server is different from that on the source server.

Possible Causes

If there are sparse files on the source server, the total size of the migrated files on the target server may be smaller than that on the source server. This is because rsync automatically truncates sparse files during transmission. The file system transparently converts metadata representing empty blocks into "real" blocks filled with null bytes at runtime.

You can check whether the files are consistent before and after the migration. For details, see **Procedure**.

NOTE

In a UNIX file system, when the file displacement is greater than the file length, the next write operation will extend the file length and form a hole in the file, creating a sparse file. This is achieved by writing brief information (metadata) representing the empty blocks to disks instead of the actual "empty" space which makes up the block, thus consuming less disk space. The full block size is written to disk as the actual size only when the block contains "real" (non-empty) data.

Procedure

1. Check the size of the file on the source server and the used disk space. The **/tmp/test-data.img** file is used as an example.
   a. Check the size of the **/tmp/test-data.img** file.
      ll /tmp/test-data.img
   b. Check the disk space occupied by **/tmp/test-data.img**.
      du -sh /tmp/test-data.img

      Figure 4-16 Checking the file size

      ```
      root@ubuntu:~# ll /tmp/test-data.img
      -rw-r--r-- 1 root root 1073741824 Aug 19 08:54 /tmp/test-data.img
      root@ubuntu:~# du -sh /tmp/test-data.img
      1.1G    /tmp/test-data.img
      ```

2. After the migration is complete, check the size of the migrated file on the target server. **Figure 4-17** shows that the used disk space decreases after the migration.

   Figure 4-17 Checking target server file size

   ```
   root@ubuntu:~# ll /tmp/test-data.img
   -rw-r--r-- 1 root root 1073741824 Aug 19 08:54 /tmp/test-data.img
   root@ubuntu:~# du -sh /tmp/test-data.img
   5.5M    /tmp/test-data.img
   ```

3. Run the following command on the source server and target server to obtain the sha256 values of the files to determine whether the files are the same.

   If the sha256 values of the files are the same, the file content is consistent.

   sha256sum /tmp/test-data.img

   Figure 4-18 Obtaining the sha256 value

   ```
   root@ubuntu:~# sha256sum /tmp/test-data.img
   82348a9b82fb96c86cd1431a32e94d67f6242ef551d28703e2b9b3f68e8f3333  /tmp/test-data.img
   root@ubuntu:~#
   ```

4.8.8 Why Can't I See Data Disks on a Windows Target Server After Migration?

Possible Causes

The SAN policy for the source server OS is Offline Shared. This means the data disks will be offline after migration.

Solutions

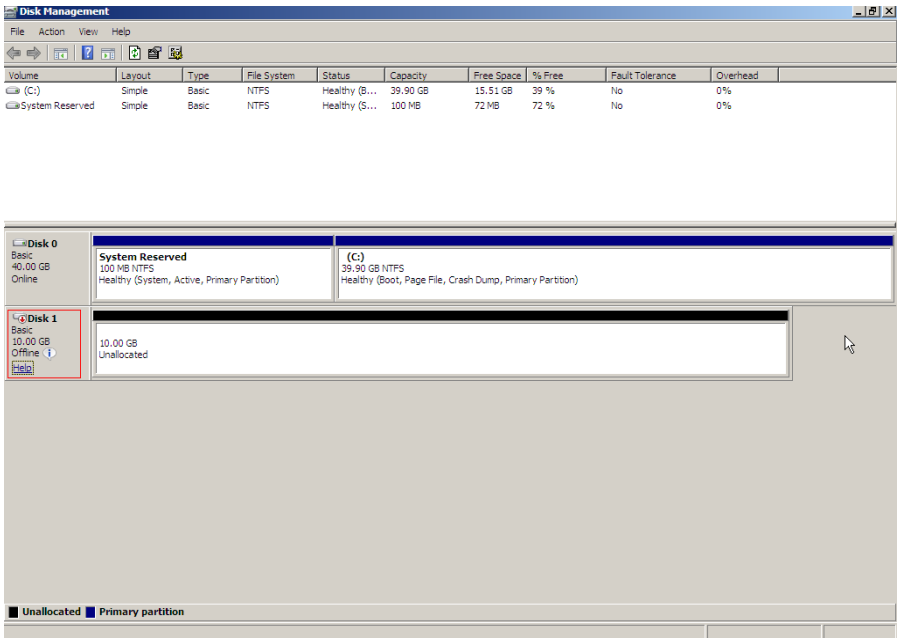
Solution 1

Step 1 Choose **Start** > **Run**.

Step 2 Enter **diskmgmt.msc** and press **Enter** to open the **Disk Management** window.

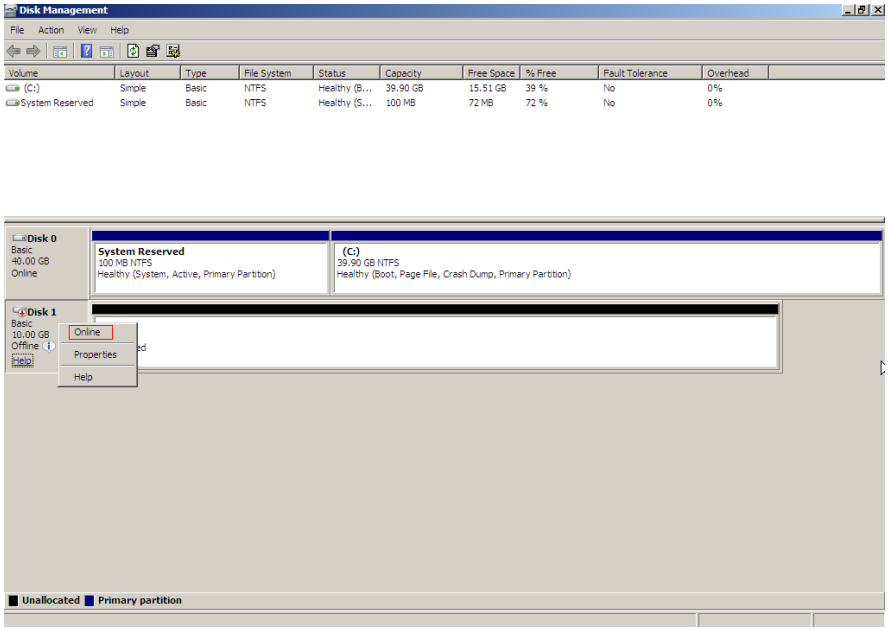
In the following figure, **disk 1** is offline.

Figure 4-19 Offline



Step 3 Right-click the offline data disk and select **online** from the pop-up menu.

Figure 4-20 Bringing the disk online



----End

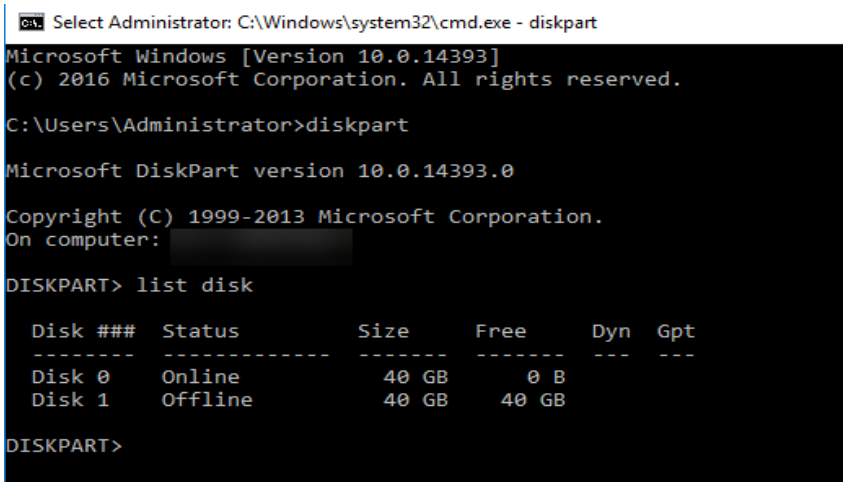
Solution 2

Step 1 Right-click the **Start** menu.

Step 2 Click **Run** and enter **cmd**.

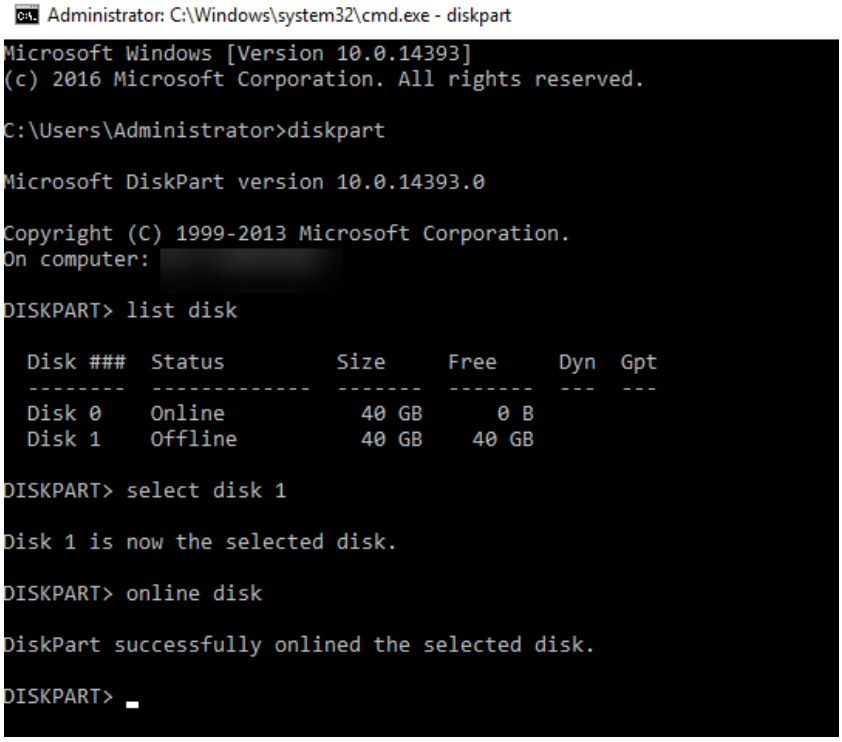
Step 3 Run **diskpart** to start the disk management tool.

Step 4 Run **list disk** to list all disks on the server. In the following figure, **disk 0** is online and **disk 1** is offline.



Step 5 Run the **select disk 1** command.

Step 6 Run the **online disk** command to change the disk status from offline to online.



Step 7 If the disk is read only after it goes online, run the **attribute disk clear readonly** command to remove the write protection on the disk.

----End

4.8.9 Why Can't a Windows Target Server Access the Internet After the Migration?

Symptom

After a migration was completed, the Windows target server could not access the Internet and message "The target server running Windows cannot access the Internet" was displayed.

Possible Causes

The possible causes are as follows:

- There are abnormal network adapter drivers on the target server.
- The network configuration of the target server is incorrect.

Solutions

- Solution for abnormal network adapter drivers
  a. Locate the abnormal network device using the device manager. Use the **Search automatically for updated driver software** option to update its driver. Then restart the target server.
  b. If the fault persists, disable the driver and enable it, and restart the target server.

c. If the fault persists, find another ECS that is in the same AZ as the target server and can access the Internet. Then, detach a data disk from the target server and attach this disk to the ECS you find.

i. On the temporary ECS, download the **VMTools** installation package to the disk you have attached but do not install VMTools.

ii. Attach the data disk back to the target server. Then, log in to the target server and install VMTools.

iii. Restart the target server.

- Solution for incorrect network configuration

  1. Open the **cmd** window, run **ipconfig** to view the IP address of the target server. Check whether the IP address is the same as that displayed on the ECS console. If they are different, a static IP address may be set for the target server. In this case, change the IP address acquisition mode to DHCP.

  2. If the EIP of the target server can be pinged, but the external domain name cannot be pinged, configure the DNS server.

4.8.10 Why Is the System Recovery Options Window Displayed When the Target Server Is Started?

Symptom

After the migration is complete, the target server starts and the System Recovery Options window is displayed.

Possible Causes

Something is wrong with the key startup files.

Solution

Run **BCDBoot** to resolve the problem.

a. Stop the target server, create a snapshot for its system disk, and detach the disk.

b. Purchase a temporary Windows server with 1 vCPU, 2 GB memory, and 40 GB system disk. The temporary server must be in the same region and AZ as the target server.

c. Attach the system disk of the target server to the temporary server as a data disk.

d. Run **cmd** as administrator on the temporary server. Run the following command:

bcdboot e:\windows /s d:

NOTE

In the preceding command, **e:\windows** indicates the path of the system disk on the target server, and **d:** indicates the path of the boot disk on the target server.

You can run **bcdboot /?** to view the help information.

e. After the command is executed, detach the disk from the temporary server and attach the disk back to the target server. Refresh the page for several times, and start the target server.

f. If the system still cannot be started, use the created snapshot for rollback. If the problem persists, contact technical support.

4.8.11 How Do I Expand the Capacity of a Windows System Disk After the Migration?

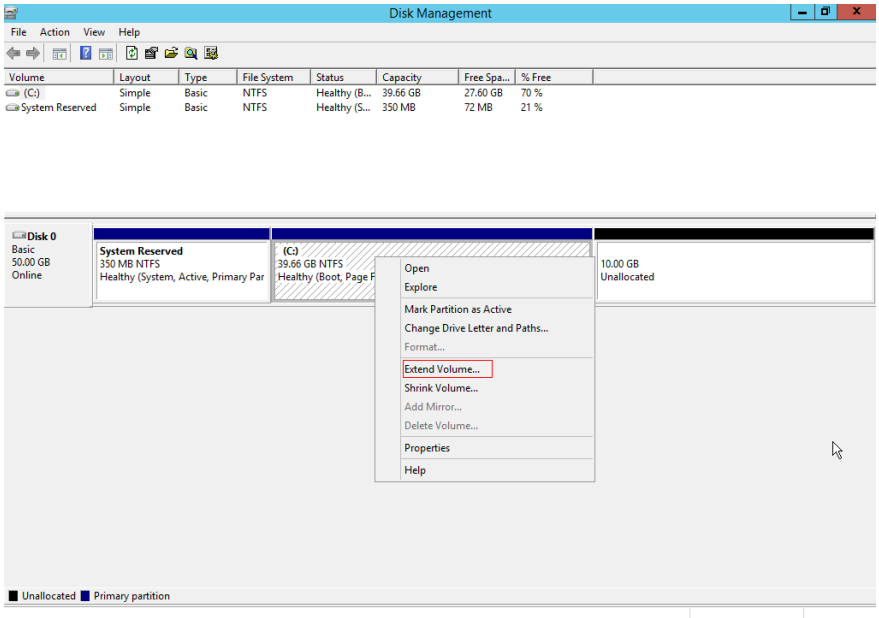
Possible Causes

If a source server disk is smaller than the target server disk, there will be unallocated space left over on the target server disk. You can expand the system disk of the target server to take advantage of the unallocated space.

Procedure

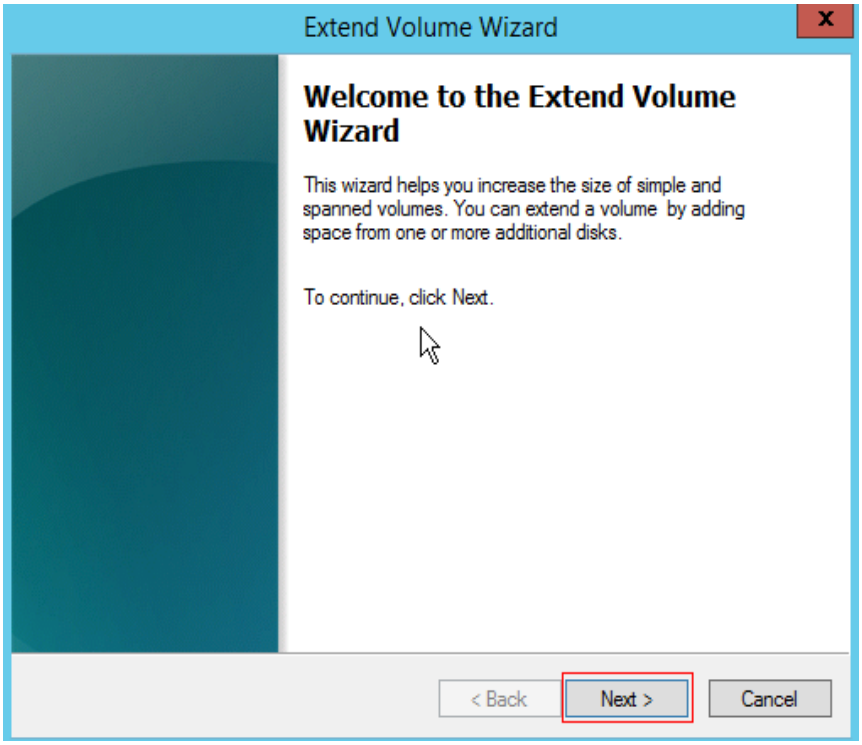
1. Choose **Start** > **Run**.
2. Enter **diskmgmt.msc** and press **Enter**.
   The **Disk Management** dialog box is displayed.
3. Right-click partition (C:) and choose **Expand Volume**.

Figure 4-21 Expanding volumes



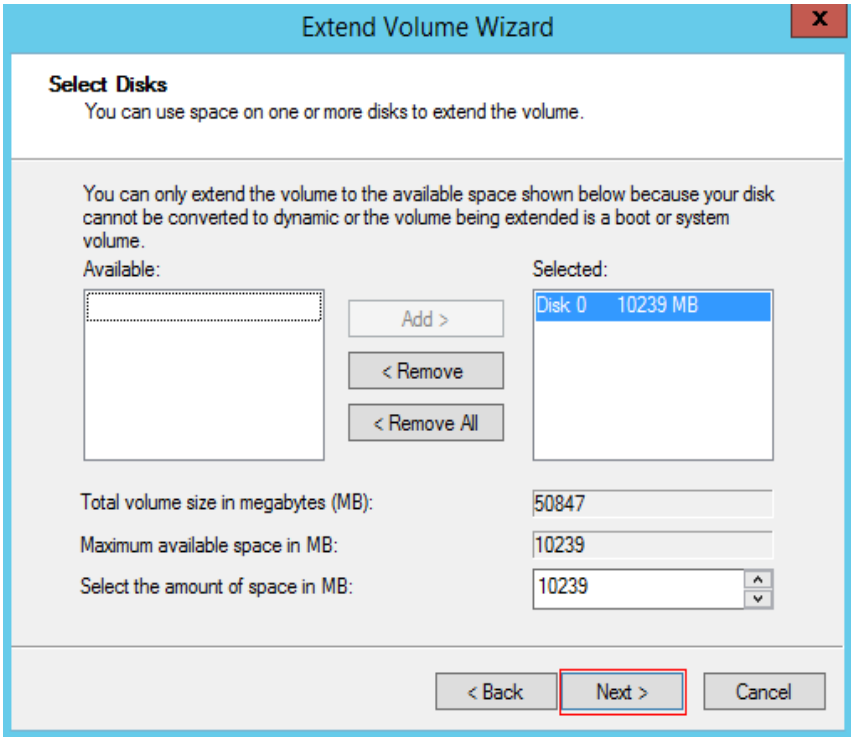
4. In the displayed dialog box, click **Next**.

Figure 4-22 Extend Volume Wizard



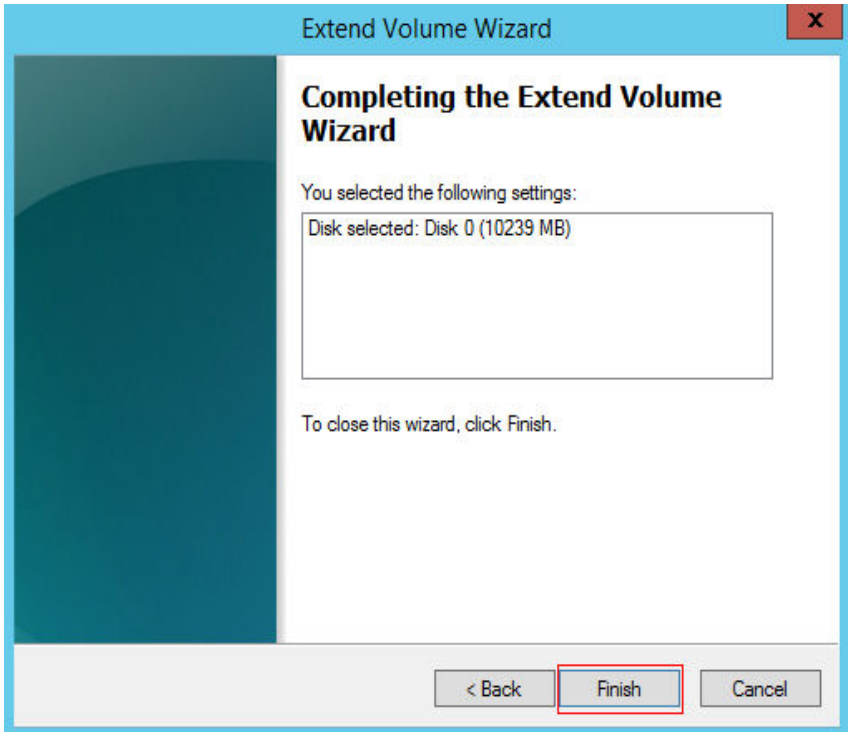
5. Add the available space to the C: drive and click **Next**.

Figure 4-23 Expanding the disk



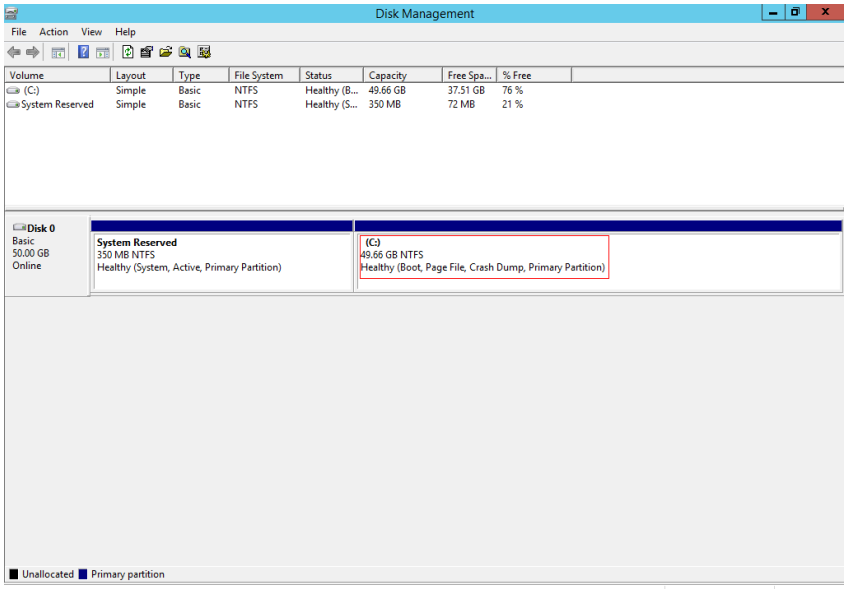
6. In the displayed dialog box, click **Finish**.

Figure 4-24 Completing the expansion



7. Check the expanded capacity.

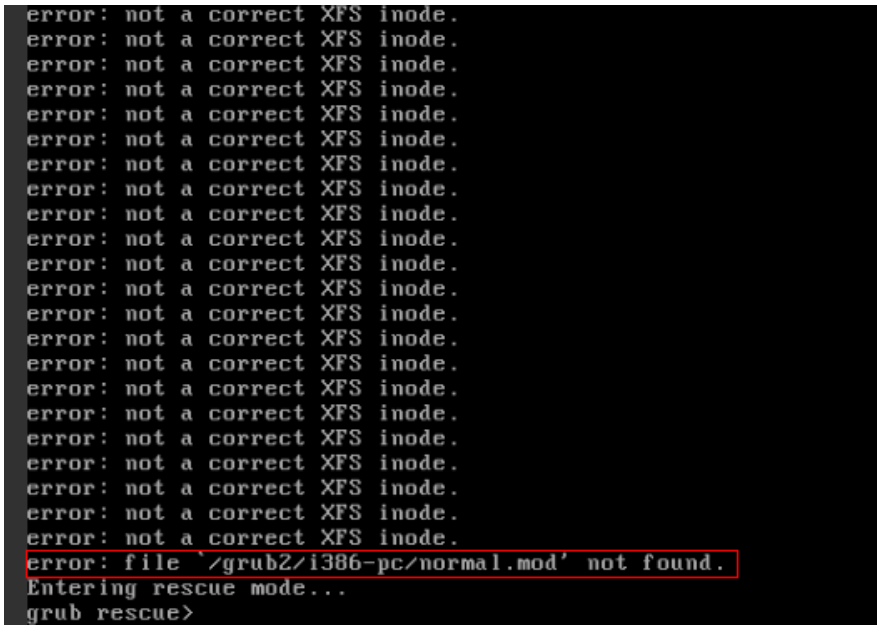
Figure 4-25 Checking the expanded capacity



4.8.12 How Do I Fix a GRUB Error Because an XFS Volume Is Mounted to the /boot Partition?

Symptom

On a source server running CentOS 7.1, an XFS volume is mounted to the **/boot** partition. After the source server is migrated to the cloud platform, the corresponding target server failed to be launched.



Possible Causes

The XFS file system volume is mounted to the **/boot** partition, causing a GRUB error.

Solutions

- Solution 1

  Detach the system disk from the target server, and attach it to another ECS running for example CentOS7.6. After the system disk is successfully attached, mount the XFS file system and unmount the file system. Then detach the disk and attach it back to the original server.

- Solution 2

  Edit the GRUB installation script file **SMS-Agent/agent/linux/resources/shell/install_grub.sh** on the source server, locate the **install_grub2** function, and add the two lines of code in the red box in the following figure. Then restart the Agent for migration.

Figure 4-26 Editing the GRUB installation script file

```
#install grub2
function install_grub2() {
    log_info "install grub2"
    if type grub-install 2>/dev/null; then
        log_info "begin to install grub2 with grub-install..."
        grub-install --no-floppy $device_path
        ret=$?
        if [ $ret -ne 0 ]; then
            log_error "Failed to install grub2 with grub-install"
            log_info "try to install grub2 with grub2-install"
        else
            log_info "success to install grub2 with grub-install"
            return 0
        fi
    fi

    if type grub2-install 2>/dev/null; then
        log_info "begin to install grub2 with grub2-install..."
        grub2-install --no-floppy $device_path
        yum -y update grub2
        grub2-install --no-floppy $device_path
        ret=$?
        if [ $ret -ne 0 ]; then
            log_error "Failed to install grub2"
            exit $ret
        fi
    else
        log_error "Can not find binary to install grub2"
        exit 1
    fi
    log_info "Success to install grub2"
}
```

4.8.13 What Do I Do If a Target Server Fails to Be Created?

Symptom

During the migration, the target server fails to be created.

Possible Causes

There are many causes for target server creation failures.

- The quota is insufficient.
- The requested AZ is unavailable.

Solutions

- The quota is insufficient.

  Check whether the relevant quotas have been exhausted. If they have, increase the quotas or delete unnecessary resources to release the quotas.

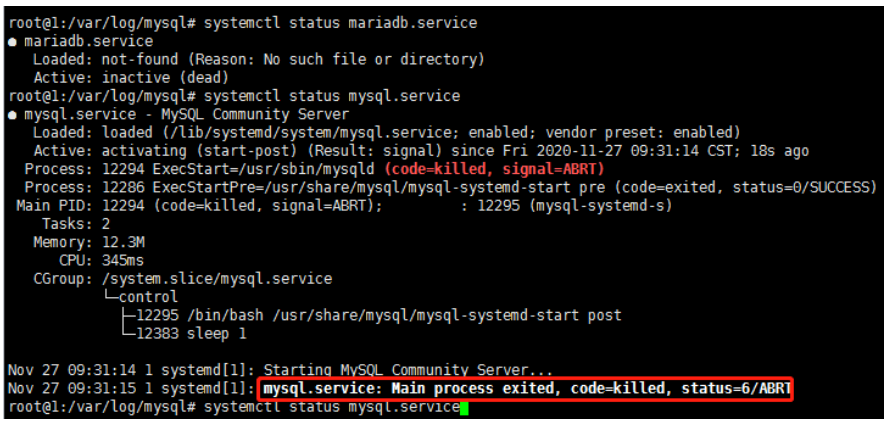
- Solution for unavailable AZ

  Delete the target server configuration. Select another AZ when you create a task again.

4.8.14 How Do I Troubleshoot a MySQL Startup Failure on the Target Server After the Migration?

Symptom

After the migration, the MySQL service on the target server cannot start up or immediately shut down after being started.



Possible Causes

The MySQL service on the source server is not stopped after the migration. As a result, the related files on the target server do not match with those on the source server.

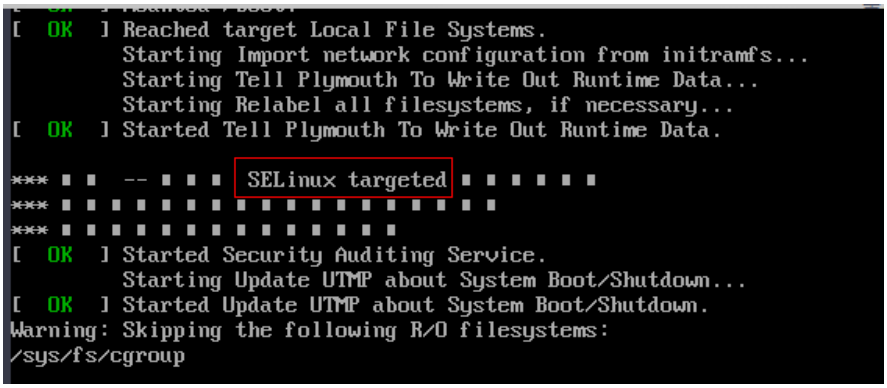
Solution

Stop the MySQL service on the source service, perform a synchronization, and try again.

4.8.15 How Do I Resolve Error "SELinux targeted" When I Start a Linux Target Server After the Migration Is Complete?

Symptom

When you started a Linux target server after the migration succeeded, message "SELinux targeted" was displayed.



Possible Causes

The SELinux configuration is incorrect.

Solution

Step 1 Find another ECS that is in the same AZ as the target server and can access the Internet. Detach the system disk from the target server and attach the disk to the ECS.

Step 2 Mount the related disk partitions.

Step 3 Locate the SELinux configuration file in the disk and set **SELinux** to **Disabled**.

CAUTION

Do not modify the SELinux configuration file of the temporary ECS.

Step 4 Mount the system disk and related partitions back to the target server and restart the target server.

----End

4.8.16 Why Do the Agent Plug-ins from the Source Cloud Service Provider Exist on the Target Server After the Migration Is Complete?

SMS migrates everything, such as disk data and service configurations, from a source server to the target server.

If the agent plug-ins from the source cloud service provider are deployed on the disks of the source server and are configured to automatically start upon system startup, these agent plug-ins will be migrated to the target server and still start upon system startup.

You can delete or uninstall these plug-ins or modify related configurations on the target server.

NOTICE

SMS only ensures data consistency before and after migration. You need to modify service configurations as needed.

4.8.17 Why Is the Usable Memory (RAM) Less Than the Total Installed Memory on a Target Server Running 64-bit Windows?

Symptom

On a target server running 64-bit Windows, the usable memory (RAM) is much less than the installed memory. For example, the system may report that there is only 2 GB of usable memory on a target server with 32 GB of memory installed.

Possible Causes

The maximum memory is set for the target server.

Solution

Step 1 Press **Win** and **R** on the keyboard to open the **Run** window. Enter **msconfig** and click **OK**. The **System Configuration** window is displayed.

Step 2 Click the **Boot** tab and click **Advanced options**. The **BOOT Advanced Options** dialog box is displayed.

Step 3 Check whether **Maximum memory** is selected. If it is, deselect it and click **OK**.

Step 4 Click **OK** to close the system configuration window and restart the target server.

----End

4.8.18 How Do I Fix Error "Failed to execute boot loader on the target ECS" When I Launch the Target Server?

Symptom

When you launched the target server, you got message SMS.3103 "Failed to execute boot loader on the target ECS."

Possible Causes

When a target server is being launched, the system reinstalls the Grub on the server. This error is reported if any files used for installing the Grub are missing, such as **normal.mod** in **/usr/lib/grub/i386-pc**.

NOTE

If the migration fails, other causes may be displayed, for example, readlink not found. In this case, check whether the **SmsAgent_Error.log** file on the source server contains the **i386-pc** field. If yes, the **i386-pc** folder is missing on the target server.

Solution

Step 1 Create an ECS in the same region and AZ and with same OS as the target server.

Step 2 Detach the system disk of the target server, and attach and mount the disk to the **vdb** disk of the ECS created in the previous step.

Step 3 Copy and paste the **/usr/lib/grub/i386-pc** folder from the ECS to the corresponding directory on the system disk of the target server to overwrite the original folder.

Step 4 Detach the disk you mounted from the ECS and attach the disk back to the target server.

Step 5 Restart the target server.

----End

4.8.19 After the Migration Is Complete, Will Deleting the Target Server Configuration or Server Record Affects the Source or Target Server?

After the migration is complete, if services are verified on the target server, and no synchronization is required, you can delete the target server configuration and the server record, and the source and target servers are not affected.

CAUTION

- If a target server configuration is deleted, the migration task will still be in the list, but the target server information will be gone. It will no longer be possible to perform incremental synchronizations. To perform the migration again, you will need to configure a target server again.
- If a server record is deleted, the migration task will be deleted from the list. To migrate the source server, you will need to restart the Agent on the source server, and the system will generate a server record for you.

4.8.20 How Do I Fix BSOD Errors When I Start a Windows Target Server After the Migration?

Symptom

After the migration, you started and logged in to the Windows target server. However, the blue screen of death (BSOD) happened and the system restarted automatically.

Possible Causes

The issue may be caused by antivirus software.

Solution

Step 1 Start the target server in safe mode. If the server cannot start, rectify the system driver faults and go to 2. If the server starts, go to 2.

Step 2 Check whether any antivirus software such as Sophos or Kaspersky is installed.

If any antivirus software is installed, there are two ways to fix the issue.

- **Method 1**
  a. Create an ECS in the same region and AZ as the target server. Detach the system disk from the target server and attach it to the ECS. Search for and delete all antivirus software-related installation directories, registries, and startup items.
  b. Attach the disk back to target server, restart the system several times to check that BSOD does not occur.
- **Method 2**
  a. Uninstall the antivirus software on the source server and perform a synchronization.

     NOTE

     If you cannot uninstall some antivirus software, contact their providers.
  b. After the synchronization, restart the target server several times to check that BSOD does not occur.

----End

4.8.21 If I Change the Password of the Source Server and Perform an Incremental Replication After the Full Migration Is Complete, Will the New Password Be Synchronized to the Target Server?

SMS migrates the passwords of source servers to target servers during the full migration. If you change the password of a Windows source server after the full migration is complete, an incremental synchronization cannot be performed. For a Linux source server, an incremental synchronization can be performed, but the new password will not be synchronized to the target server.

CAUTION

- After changing the password of the source server, you need to restart the server to apply the change.
- For a Windows source server, after the full migration is complete, restarting the source server or Agent will disconnect the Agent from SMS. If this happens, you cannot perform an incremental synchronization for the source server. You will need to delete the original migration task, create a new task, and perform a full migration again.
- For a Linux source server, after the full migration is complete, you can perform an incremental synchronization even if you have restarted the source server or Agent. However, if you change the password of the source server, the new password will not be synchronized to the target server.

5 Change History

Released On	Description
2023-11-30	Updated **FAQs**.
2023-03-31	Updated **FAQs**.
2022-07-14	Updated **FAQs**.
2022-04-10	The issue is the first official release.