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Introduction

This installation guide includes information on installing ArcSDE® 64-bit for Oracle®, setting up your geodatabase, and creating an ArcSDE service. It also contains a topic with instructions for moving an existing ArcSDE installation from 32-bit to 64-bit.

Each ArcSDE disk contains folders named by platform. These contain the following:

- Directories named for each database—These contain the installation files for the ArcSDE component for the database indicated. Those directories that include "64" in the name indicate these are installations of 64-bit ArcSDE on that particular DBMS. For example, the folder ArcSdeOracle10g64 contains the installation files for ArcSDE 64-bit for Oracle 10g.

- A documentation_server folder—This contains the ArcSDE administration command reference and the installation guides, one of which you are reading now. The administration command reference contains syntax and usage for the ArcSDE commands, the installation guides contain instructions for the installation and setup of the ArcSDE component.

A new installation of the ArcSDE 64-bit component of ArcGIS Server Enterprise for Oracle is a two step process.

1. Install ArcSDE for Oracle. On Windows, the ArcSDE setup program will install the Microsoft Windows Installer if required before continuing with the ArcSDE for Oracle installation. After ArcSDE for Oracle is installed on Windows, you will have the option to start the Post Installation wizard. On Linux machines, you will manually proceed with the postinstallation setup.

2. Perform the postinstallation setup, which defines the ArcSDE administrative user's (the SDE user's) environment, sets up the geodatabase repository, authorizes ArcSDE, and creates the ArcSDE service.

For guidelines on optimizing both your Oracle server and ArcSDE server configurations, see the help topics in the section Geodatabases and ArcSDE/Administering ArcSDE geodatabases in the ArcGIS Server help or ArcGIS Desktop online help at http://webhelp.esri.com/arcgisdesktop/9.3/index.cfm prior to installing the ArcSDE component.

If you have an existing 32-bit ArcSDE installation, see the topic Moving to ArcSDE 64-bit on Linux or Moving to ArcSDE 64-bit on Windows for instructions.
Installing the ArcSDE 64-bit component on Windows
System requirements

ESRI’s ArcSDE 64-bit component has certain minimum computer system requirements. Your computer system is required to meet these minimum requirements to successfully install and use ArcSDE for Oracle.

Operating system

Which operating system (OS) is supported depends on the release of Oracle and ArcSDE being used. For specifics and the latest information on supported system environments for ArcSDE for Oracle, see http://support.esri.com, and navigate to Software > ArcGIS Server > System Requirements. In general, though, the following Windows operating systems are supported:

- Microsoft Windows Server 2003® (64-bit)
- Microsoft Windows Server 2008® (64-bit)

Note: Oracle 11g and therefore, ArcSDE for Oracle, are not currently supported on Windows Server 2008 64-bit.

Free disk space

The ArcSDE component installed on the computer system requires approximately 140 MB of disk space.

Oracle requirements

Separate from ArcSDE requirements, Oracle has certain minimum computer system requirements. Your computer system is required to meet these minimum requirements to successfully install and use Oracle. For the latest in Oracle's requirements, consult the Oracle Web site (http://www.oracle.com/index.html).
Installing ArcSDE for Oracle

Installation overview
The installation requires system administrator privileges on the server where ArcSDE is to be installed.

The installation procedure includes the following steps:

   Each machine on which the ArcSDE component of ArcGIS Server Enterprise Edition is installed requires an authorization file, which must be written to each geodatabase. Each new version of the ArcSDE component requires a new authorization file.
   
   There are several ways to obtain an authorization file and register ArcSDE. You can visit https://service.esri.com to obtain an authorization file (by email, fax, phone, or mail) before installing the ArcSDE component. You can also obtain an authorization file and register ArcSDE using the Post Installation wizard after installing. (This is the recommended method.) See ArcSDE authorization for registration methods using the Post Installation wizard.

2. Start the setup program.
   Insert the ArcSDE component media into the appropriate drive, choose the ArcSDE for Oracle option on the ArcSDE installation dialog box, and follow the installation instructions in the wizard to install the ArcSDE component. For detailed installation instructions, see the topic Installing the ArcSDE component.

3. Complete the postinstallation setup.
   The postinstallation requires a valid DBMS to be installed, a database set up and available for connections, and access to the Oracle client files (this can be from an Oracle client only or database software installation). The Post Installation wizard will create an administrative user (sde) and tablespace, grant the user permissions in the database necessary for installation, set up the geodatabase repository in the database, authorize ArcSDE, and create and start an ArcSDE service. The Post Installation wizard automatically launches after installation is complete. Postinstallation must be completed to successfully set up ArcSDE in the database. For detailed instructions, see the topic Postinstallation overview.
Installing the ArcSDE component

Follow these steps to install the ArcSDE component of ArcGIS Server Enterprise on
Windows. Also be sure to read the important notes at the bottom of this topic.

1. Obtain an authorization file for the machine on which you will be installing the
ArcSDE component of ArcGIS Server Enterprise Edition. This is not required to
install the ArcSDE component but is required to complete the postinstallation
setup.

2. Log into the server as a user with administrative privileges.

3. Close all applications on your computer.

4. Insert the ArcSDE component media into the appropriate drive.

5. Navigate to the ArcSDE\windows\ArcSDEOracle<version>64 folder and launch
setup64.exe to begin the installation.

6. To complete the component installation, follow the directions in the setup
program.

During the installation, you will be asked to read the license agreement and
accept it or exit if you do not agree with the terms. If you do not accept the
license agreement, the installation will terminate. The license agreement
dialog contains a link to view the license agreement in another language.

Also during the installation, you can set the location on disk in which the
ArcSDE files will be installed or accept the default location.

7. After the ArcSDE component installation completes, you can launch the Post
Installation wizard. The Post Installation wizard allows you to create an SDE
DBMS user and tablespace, set up the geodatabase repository in the
database, authorize ArcSDE, and create and start an ArcSDE service. See the
Postinstallation overview for more information.

Important notes for installation

- If ArcSDE 64-bit is installed on the same server as a 32-bit client (for
example, ArcGIS Server or ArcIMS), you must set SDEFORCEXDR to 1
(true) in the client system environment variables. If you do not, the client
and ArcSDE will attempt to use the same shared memory, and the client's
connection to the geodatabase will fail.

- If you are installing ArcSDE on a different server than Oracle, see
Installing the ArcSDE component and Oracle on separate machines.

- New installations of ArcSDE 9.3 for Oracle do not install public synonyms
for use with ST functions and operators. That means when using ST
functions and operators, you must qualify them with the sde schema. For
example, you would type "SELECT id, sde.st_is3d (geometry)" rather than
"SELECT id, st_is3d (geometry)".
Installing the ArcSDE 64-bit component on Windows

If you are upgrading from a previous release of ArcSDE, the public synonyms will still be present and you do not need to qualify ST functions and operators.
Installing the ArcSDE component and Oracle on separate servers

If you are installing the ArcSDE component on a different server than Oracle, there are additional steps you must take.

1. Make sure Oracle is installed and running on the remote server.

2. Install the Oracle Net Software on the server where ArcSDE is to be installed. Ensure SQL will operate from this remote machine to the Oracle server.

3. Copy the shared libraries used by EXTPROC to the Oracle server. These libraries include st_shapelib plus the Geometry library and the Projection Engine library. (The names of these files vary depending on what operating system (OS) you are using.) Be sure the files copied to the Oracle server are designed to run on the operating system of the Oracle server. For example, if ArcSDE is installed on a Linux machine, but Oracle is installed on a Solaris machine, the dll and lib files you copy to the Oracle server must be for Solaris. To get the files for different operating system, you can install the software files of the ArcSDE component on the Oracle server, creating the SDEHOME files, and delete everything but the three required library files.

<table>
<thead>
<tr>
<th>Library name</th>
<th>OS-dependent file names</th>
</tr>
</thead>
<tbody>
<tr>
<td>st_shapelib</td>
<td>st_shapelib.dll (Windows), libst_shapelib.so (Solaris, Linux, HP-UX Itanium), libst_shapelib_64.so (IBM), or libst_shapelib.sl (HP-UX PA-RISC)</td>
</tr>
<tr>
<td>Projection Engine</td>
<td>pe.dll (Windows), libpe.so (Solaris, Linux, HP-UX Itanium), libpe_64.so (IBM) or libpe.sl (HP-UX PA-RISC)</td>
</tr>
<tr>
<td>Geometry</td>
<td>sg.dll (Windows), libsg.so (Solaris, Linux, HP-UX Itanium), libsg_64.so (IBM) or libsg.sl (HP-UX PA-RISC)</td>
</tr>
</tbody>
</table>

4. These files can be found in the bin (Windows) or lib (UNIX/Linux) directory of SDEHOME after you've installed the ArcSDE component. You can copy these files to the %ORACLE_HOME%\lib (Windows) or $ORACLE_HOME/lib (UNIX/Linux) directory on the Oracle server, which is the default location that Oracle looks in for shared libraries. Or, you can leave these files where they
were installed or move them into any directory that is accessible to the user that owns ORACLE_HOME.

5. If you do not use the default location under ORACLE_HOME for the library files, you will need to define the environment variable EXTPROC_DLLS for the EXTPROC so it can find st_shapelib. This is done in the listener configuration file listener.ora. See Configuring Oracle Net Services to use ST_Geometry SQL functions for more information.

6. The library definition in the Oracle data dictionary must be updated with the correct library path to the file containing st_shapelib. Altering the definition of the library path will invalidate package bodies that refer to it, so the package bodies of some ArcSDE stored procedure packages should be recompiled using Oracle.

7. Perform the preinstallation tasks and install the ArcSDE component on the ArcSDE server as described in the topics Installing the ArcSDE component (Windows) or Preinstallation requirements and Installing the ArcSDE component (UNIX/Linux).

8. Perform the ArcSDE postinstallation steps as described in the topics relevant to each OS.
   - **Windows**
     
     Postinstallation overview, Setting up the SDE user environment, Setting up the geodatabase repository, and ArcSDE authorization
     
     To create the service on Windows, you must use the sdeservice -o create command. The Post Installation wizard is not designed to create a service for ArcSDE setups that are on a remote server.

     The -d option for the sdeservice is required and you must enter the name of the Oracle Instance (SID). However, since it is not possible for a Windows service to have a dependency on a service that is on a remote server, you will need to add to the sdeservice syntax the -n parameter to negate the dependency.

     At a command prompt, type sdeservice -h for syntax information or refer to the ArcSDE Administration Command Reference for syntax and explanation of the sdeservice command.

   - **UNIX/Linux**
     
     ArcSDE postinstallation setup, ArcSDE authorization, and Starting the ArcSDE service on UNIX

9. For Oracle to connect to a remote instance, an environment variable must be set to identify the remote Oracle instance through the net service name.

   If the ArcSDE server is on Windows, set LOCAL to the Oracle net service name in the SDEHOME\etc\dbinit.sde file. If the ArcSDE server is on UNIX, set TWO_TASK to the Oracle net service name. The ORACLE_HOME variable must also be set. Consult your Oracle documentation for further information on these environment variables.
**Note:** You could use the TWO_TASK or LOCAL variable to specify the Net Service Name of a local Oracle database. However, this is not recommended because it results in additional overhead when making a connection to the database. For local connections, you should use the Oracle_SID.

10. The TNS_ADMIN variable must be set if the default location of the tnsnames.ora file is not used.

Related concepts found in the help

You can get more information related to the SDE user and permissions in the ArcGIS Desktop online help (http://webhelp.esri.com/arcgisdesktop/9.3) or the help system installed with ArcGIS Server or ArcGIS Desktop. Use the links below to open the online topics, or open the help and search for the following titles:

- **Configuring Oracle Net Services to use SQL functions**
- **The dbinit.sde file**
ArcSDE postinstallation setup

Postinstallation overview

Once the ArcSDE component is installed, you must set up your ArcSDE geodatabase, authorize ArcSDE for use, and create an ArcSDE service. The Post Installation wizard provides an easy way to complete these tasks. These steps can also be performed manually. The Post Installation wizard will guide you through the following options:

- **Setting up the SDE user environment**—If you do not already have an SDE user and tablespace, the Post Installation wizard will create them by connecting to Oracle as the sys user. The SDE user and tablespace must exist before the rest of the postinstallation setup will succeed. Security at your site may dictate you skip this part of the setup and allow your Oracle database administrator (dba) to manually create the SDE user and tablespace. To skip this step, select the custom postinstallation setup option. There are SQL scripts provided to manually set up the SDE user environment if necessary. See Creating the SDE user and tablespace script for details.

- **Setting up the ArcSDE geodatabase repository**—This is a crucial step in the postinstallation setup. This postinstallation option allows you to define the ArcSDE configuration files to be used by ArcSDE in the database. If you modified a dbtune.sde, dbinit.sde, or giomgr.defs file and want to use one or all of those, you will have a chance to include them here. Accept the defaults if you do not have any custom files to use. The ArcSDE system tables, geodatabase system tables, stored procedures, and locators are all created when setting up the geodatabase repository. This must be done logged in as the SDE user. The SDE user requires specific permissions to successfully run this part of the postinstallation setup. See Required Oracle permissions to create the geodatabase for a list of these permissions. If this step does not run successfully, you will not be able to start an ArcSDE service or connect to the geodatabase. This step can be performed manually with the sdesetup command.

- **Authorizing ArcSDE**—Each machine on which the ArcSDE component of ArcGIS Server Enterprise Edition is installed requires a unique authorization file. This postinstallation option authorizes your geodatabase repository using the authorization file. The ArcSDE service will not start and direct connections will be refused unless your geodatabase repository has been configured using a valid authorization file. You can reconfigure your geodatabase repository using the sdesetup command with the update_key operation. See the ArcSDE Command Reference for details.

- **Creating the ArcSDE service**—Once ArcSDE has been authorized for use, an ArcSDE service can be created. If the information provided to create the ArcSDE service is complete, the Post Installation wizard will start the ArcSDE service for you. If you do not intend to use an ArcSDE service for any of your client connections and instead plan to use direct connections for all client applications, this step can be skipped. For details
Choose a Complete or a Custom postinstallation setup.

A Complete installation will guide you through all of the postinstallation options. If you select a custom installation, you can choose from any of the available postinstallation options.
The Custom installation is recommended for advanced users or users upgrading an existing ArcSDE geodatabase. See the topic Upgrade information for details.

You would use a custom postinstallation if any of the following are true:

- You or your DBA manually created the SDE DBMS user so you do not need the Post Installation wizard to perform the first option.
- You do not yet have your authorization file. You can complete the first two options then come back to complete the last two.
- You are upgrading the geodatabase from a previous release, so you do not need to repeat the first option.
- If none of your client applications will connect using an ArcSDE service, you do not have to complete the last option.

If you need to run the Post Installation wizard again at a later time, it is available from Start > All Programs > ArcGIS > ArcSDE > ArcSDE for Oracle Post Installation.
Required Oracle permissions to create the geodatabase

To run sdesetup and create the ArcSDE geodatabase in your Oracle instance, you have to grant the following additional permissions to the SDE user in Oracle for the setup to succeed. On Windows, if you use the Post Installation wizard to create the SDE user, these permissions are granted automatically.

All the same permissions are necessary for the schema owner if creating a user-schema geodatabase, except ADMINISTER DATABASE TRIGGER; that permission is only necessary when installing or upgrading the SDE master geodatabase.

- ADMINISTER DATABASE TRIGGER
- CREATE SESSION
- CREATE TABLE
- CREATE TRIGGER
- CREATE PROCEDURE
- CREATE INDEXTYPE
- CREATE LIBRARY
- CREATE OPERATOR
- CREATE PUBLIC SYNONYM
- CREATE SEQUENCE
- CREATE TYPE
- CREATE VIEW
- DROP PUBLIC SYNONYM

If you plan to use autoregistration for SDO_GEOMETRY tables, you must also grant the SDE user SELECT ANY TABLE. Note: The SELECT ANY TABLE privilege is also required for the SDE user to run a geodatabase compress operation. You can grant the SDE user that privilege now, or wait to grant it prior to each compress operation.

For an explanation of why each of these are needed, see the topic User permissions for geodatabases in Oracle in the ArcGIS Server or ArcGIS Desktop help.

After the geodatabase has been created, you may revoke the following permissions from the SDE user or schema owner user account:

- ADMINISTER DATABASE TRIGGER
- CREATE INDEXTYPE
- CREATE LIBRARY
- CREATE OPERATOR
- CREATE PUBLIC SYNONYM
- CREATE SEQUENCE
- CREATE TYPE
- CREATE VIEW
- DROP PUBLIC SYNONYM

The Oracle SYS user must also grant EXECUTE permissions on a number of packages to the PUBLIC role. These permissions cannot be revoked.

```
sqlplus sys/*****

GRANT EXECUTE ON dbms_pipe TO public;

GRANT EXECUTE ON dbms_lock TO public;
```
ArcSDE uses DBMS_PIPE to store row ids during the insert process and uses DBMS_LOCK to mark entries in the PROCESS_INFORMATION table as active. Access for PUBLIC is required because these packages are used both directly and via definers-rights stored procedures. A stored procedures with definers-rights cannot use permission from roles.

See Creating the SDE user and tablespace script.
Setting up the SDE user environment

This postinstallation setup option does the following:

- Grants EXECUTE on DBMS_PIPE and DBMS_LOCK to Public.
- Creates the SDE user's default tablespace.
- Creates the SDE user if it does not already exist.
- Grants the SDE user the required privileges. See the topic Creating SDE user and tablespace script for privileges granted.

To set up the SDE user and tablespace, the Post Installation wizard connects to Oracle as the sys user. You must provide the sys user password. Leaving the net service name blank will result in connecting to Oracle using the default net service name on your local machine.

Once connected to Oracle as the sys user, you are required to set a password for the SDE user. You may also enter a tablespace name and assign a path to the tablespace file or accept the defaults provided. If the SDE user and tablespace of the required size already exist, this step is skipped.
The SDE tablespace and SDE user are created and the required privileges granted to the SDE user to manage the geodatabase repository.

**Note:** ArcSDE requires an SDE tablespace of at least 400 MB in size. If an SDE tablespace already exists (for example, from an earlier SDE or ArcSDE installation), the Post Installation wizard will detect it and increase its size to a minimum of 400 MB. If the tablespace is already 400 MB or larger, the tablespace size will not be changed. For more information on upgrading, please see the topic Upgrade information.

**Note:** Upgrading requires certain permissions to be granted to the SDE user. Please see Required Oracle permissions to upgrade for specifics.

**Creating the SDE user and tablescape script**

If you decide to not use the Post Installation wizard to set up your SDE user environment, you may modify and use the createsdeoracle.sql script to manually create the SDE user and tablespace. The createsdeoracle.sql script is located at %SDEHOME%/tools/oracle.

Related concepts found in the help

You can get more information related to the SDE user and permissions in the ArcGIS Desktop online help (http://webhelp.esri.com/arcgisdesktop/9.3) or the help system installed with ArcGIS Server or ArcGIS Desktop. Use the links below to open the online topics, or open the help and search for the following titles:

**The ArcSDE administrative account**

**User permissions**
Setting up the geodatabase repository

Once the SDE tablespace and user are created, you can set up the geodatabase repository. Options are provided to specify custom *giomgr.defs*, *dbinit.sde*, and/or *dbtune.sde* files.

*The *giomgr.defs* file contains a parameter—TEMP—that is used to specify the full path name to a temporary disk space directory. This parameter is commented out. If left commented out, the default location for this is the temporary folder of the user logged into the Windows machine at the time the geodatabase is created. If that location is acceptable, you do not have to uncomment and change this parameter value. If not, alter the *giomgr.defs* file, uncommenting the TEMP parameter and setting it to the full path name you want to use, then save the *giomgr.defs* file. If you do not alter this value before setting up the ArcSDE geodatabase repository, you can alter it after the geodatabase is created using the sdeconfig alter operation. See the ArcSDE administration command reference installed with the ArcSDE component of ArcGIS Server Enterprise for information on this command.

You have the option of using the default *dbtune.sde* file provided with ArcSDE, using your own custom *dbtune.sde* file (which could include such things as altering the default geometry storage type for your geodatabase to use when storing data and defining the tablespaces used to store the geodatabase tables), or use the default *dbtune.sde* file but alter the default geometry storage type by selecting one of the three geometry storage types offered on this dialog box.
The geometry storage options equate to the following in the DBTUNE table:

- Binary storage using LOB = SDELOB
- Oracle spatialOracle Locator = SDO_GEOMETRY
- Spatial type for Oracle = ST_GEOMETRY

If you do not have custom files and do not want to change the default geometry storage type, accept the default configuration files.

**If you are upgrading ArcSDE**: The Post Installation wizard will not import a custom dbtune.sde file. In the Define dbtune.sde file section, as shown in the above dialog box, do not choose to use a custom dbtune.sde file when upgrading ArcSDE. If you want to use a custom dbtune.sde file, you must manually import the custom file using the sdedbtune -o import command. For more information on the sdedbtune command, see the ArcSDE Administration Command References help available from Start > Programs > ArcGIS > ArcSDE > Command References, on the ArcSDE media at \documentation_server\Admin_Cmd_Ref, or in %SDEHOME%\Documentation\Admin_Cmd_Ref.

After the configuration files are defined, you can connect to Oracle to set up the geodatabase repository. Setting up the repository is a crucial step in the postinstallation setup. If you do not choose to perform this postinstallation option using the Post Installation wizard, you must manually execute the sdesetup command at the DOS prompt.

The geodatabase repository contains all the ArcSDE metadata for administering the ArcSDE geodatabase. Refer to the sdesetup command in the ArcSDE Administration Command Reference (%SDEHOME%\Documentation\Admin_Cmd_Ref) for specifics on what is occurring with this operation.
Provide your SDE user password and Oracle net service name to connect to Oracle as the SDE user and create the repository.

If you are performing an upgrade of an existing ArcSDE geodatabase, you will have to grant additional permissions to the SDE user in Oracle for the upgrade to take place successfully. Refer to the topic Required Oracle permissions to upgrade for further information.

To manually set up the repository

If you choose not to use the Post Installation wizard to set up the repository, you must manually execute the sdesetup command at the DOS prompt.

Refer to the sdesetup command reference in the ArcSDE Administration Command Reference (%SDEHOME%\Documentation\Admin_Cmd_Ref) for specifics on what is occurring with this operation.

Provide your SDE user password and Oracle net service name to connect to Oracle as the SDE user and create the geodatabase repository.

Related concepts found in the help

You can get more information related to setting up the repository in the ArcGIS Desktop online help (http://webhelp.esri.com/arcgisdesktop/9.3) or the help system installed with ArcGIS Server or ArcGIS Desktop. Use the links below to open the online topics, or open the help and search for the following titles:

The dbtune file and the DBTUNE table
Installing the ArcSDE 64-bit component on Windows

DBTUNE configuration keywords
DBTUNE configuration parameter name-configuration string pairs
About geometry storage types
A spatial type for Oracle
The ST_Geometry storage type
Using the Oracle Spatial geometry type
ArcSDE Compressed Binary storage
The OGC Well-Known Binary representation for geometry
The giomgr.defs file and the SERVER_CONFIG table
The dbinit.sde file
System tables of a geodatabase stored in Oracle
ArcSDE authorization

Each machine on which the ArcSDE component of ArcGIS Server Enterprise Edition is installed requires a unique authorization file. You can obtain an authorization file using the Post Installation wizard. If you have already obtained your authorization file, the Post Installation wizard will configure your geodatabase repository using your authorization file.

Every ArcSDE geodatabase that resides on the same machine must be authorized using the authorization file because the authorization information is stored in the geodatabase repository. This includes geodatabases stored in the schemas of users other than the SDE schema. You will not be able to make any connections to the geodatabase unless your geodatabase repository has been configured using a valid authorization file.

To reconfigure the repository with an updated authorization file, run through this portion of the Post Installation wizard again. To launch the Post Installation wizard at a later time, go to Start > All Programs > ArcGIS > ArcSDE > ArcSDE for Oracle Post Installation. If the software authorization option is not selected with the repository setup option, you will also be required to provide the following information to connect to the spatial database:

Provide your SDE user password and Oracle net service name to connect to Oracle as the SDE user and write the license file to the geodatabase repository. No additional permissions are required.

To successfully register and authorize ArcSDE:
Choose your registration option

You can configure the geodatabase repository using two methods:

1. **I have installed my software and need to register it.**

   Select this option if you do not already have an authorization file. There are several methods to provide your registration information.
Select the registration method you would like to use. This is the method in which you will provide your registration information, including the registration number you received with the software. After providing your registration information, your authorization file will be emailed to you.

Tip

- Register now using the Internet enables you to authorize the software immediately. It requires an Internet connection.

2. I have received an authorization file from ESRI and am now ready to finish the registration process.

Select this option if you have already received your authorization file from ESRI Customer Service. If you select this option, you can either browse to the location
of the file (if you received the file by email), or you can manually enter the
authorization information.

If you choose the option to browse to an authorization file on disk, you are
required to Choose or enter the location of the authorization file that you
received from Customer Service.

If you choose the option to manually enter the authorization information, you are
required to provide the following information: (This information can be obtained
from the authorization file you received by mail, email, telephone, or fax)

- Feature name
- Version number
- Time-out date
- Registration number
- Authorization code

**To manually authorize ArcSDE**

If you choose to manually authorize ArcSDE, you must use the sdesetup command.

You can manually register ArcSDE with an authorization file in two ways:

1. If you already have your authorization file, run the sdesetup command using
   the install or upgrade operations and designate the location of the
   authorization file with the -l option.

2. If you don't yet have your authorization file, run the sdesetup command with
   the install or upgrade operations but without the -l option. Once you receive
   your authorization file from ESRI, run sdesetup again using the update_key
   operation and the -l option.

The syntax for the sdesetup command with the update_key operation is as
follows:

```bash
sdesetup -o update_key -d <ORACLE9I|ORACLE10G|ORACLE11G>
   -l <key> [-u <DB_Admin_user>] [-p <DB_Admin_password>]
   [-H <sde_directory>] [-s datasource] [-i <service>]
   [-N] [-q]
```

Where `<key>` is the location of your authorization file

For example:

```bash
sdesetup -o update_key -d ORACLE10G -l c:\license\keycode.txt -u sde -p sde
```

Refer to the sdesetup command in the ArcSDE Administration Command
Reference (%SDEHOME%\Documentation\Admin_Cmd_Ref) for specifics on what
is occurring with this operation.
Creating an ArcSDE service

This option of the Post Instalation wizard allows you to create an ArcSDE service. You must provide a unique TCP/IP port number and service name, the password that you used for your SDE user, the ORACLE SID, and server name. Your Oracle_SID is the Oracle Service Name Identifier, the unique name for your Oracle instance. The server name is required to determine the server to which you will be connecting; by default, your machine name is provided. All fields in this dialog box are required.

This portion of the Post Installation wizard adds an entry to the services file of your server machine (usually, this is c:\WINDOWS\system32\drivers\etc\services). If you need to modify your service later, you can use the sdeservice command at the DOS prompt, or run through this option in the Post Installation wizard again. Information on the sdeservice command can be found in the ArcSDE Administration Command Reference (%SDEHOME%\Documentation\Admin_Cmd_Ref).

To manually create the ArcSDE service

You can use the sdeservice command at the DOS prompt to manually create or modify the ArcSDE service. Information on the sdeservice command can be found in the ArcSDE Administration Command Reference (%SDEHOME%\Documentation\Admin_Cmd_Ref).

Note: Creating an ArcSDE service is not required if all clients connecting to the geodatabase will use a direct connection. For information on setting up the client
Installing the ArcSDE 64-bit component on Windows

machines for a direct connection, see the topic "Setting up a direct connection to Oracle" in the ArcGIS Server or Desktop help.

Related concepts found in the help

You can get more information related to the ArcSDE service in the ArcGIS Desktop online help (http://webhelp.esri.com/arcgisdesktop/9.3) or the help system installed with ArcGIS Server or ArcGIS Desktop. Use the links below to open the online topics, or open the help and search for the following titles:

An overview of ArcSDE geodatabase connections
Starting an ArcSDE service
Stopping an ArcSDE service
Pausing and resuming an ArcSDE service
Accessing an ArcSDE service through a firewall
Troubleshooting the ArcSDE service
Running multiple installations on the same machine

There are two possible scenarios for running multiple installations on the same machine.

- **Running ArcSDE for two different DBMS installations on the same machine**—It is possible to install more than one ArcSDE service for different DBMSs on the same machine. Some ESRI products share the same administrator commands (for example, sdeservice and sdemon). To successfully run more than one ArcSDE service on the same machine, do the following:
  1. Before running the postinstallation setup, make sure the ArcSDE service that you want to administer is the ESRI product listed first in your System PATH.
  2. Make sure the SDEHOME variable in your PATH is set to your current ArcSDE installation location.

  **Steps 1 and 2 above apply whenever administrator commands for ESRI products are run. If you do not change your System PATH, the administrator commands for the wrong product may be run.**

  3. Run the ArcSDE postinstallation setup for the chosen DBMS.
  4. You can now manage the multiple ArcSDE services/installations by switching back and forth between ArcSDE environments through the System Control Panel or by using the ArcSDE administrative commands with the -H option set to the appropriate SDEHOME location.

- **Running more than one ArcSDE service for the same DBMS installation**—For instructions on doing this, see the topic Using multiple geodatabases within a DBMS in the ArcGIS Server or ArcGIS Desktop help.
**ArcGIS Installation Guide**

**The next steps**

After you finish the postinstallation setup, you're ready to add other users, set up client connections, and add data to your geodatabase. The following is a list of help topics to assist you in these tasks. Topics can be found in the ArcGIS Desktop online help (http://webhelp.esri.com/arcgisdesktop/9.3) or the help system installed with ArcGIS Server or ArcGIS Desktop. Use the links below to open the online topics, or open the help and search for the titles.

<table>
<thead>
<tr>
<th>TASK</th>
<th>RELATED TOPICS</th>
</tr>
</thead>
</table>
| Geodatabase users | Adding users to an ArcSDE geodatabase  
User permissions  
Grouping users by access needs |
| Client connections | Configuring Oracle Net Services to use SQL functions  
An overview of ArcSDE geodatabase connections  
Setting up clients for a direct connection  
Creating spatial database connections |
| Adding data     | An overview of adding datasets to the geodatabase                         |
Required Oracle permissions to upgrade

To upgrade the ArcSDE geodatabase in your Oracle instance, you have to grant the following additional permissions to the SDE user in Oracle for the upgrade to succeed. All the same permissions are necessary for the schema owner if upgrading a user-schema geodatabase, except ADMINISTER DATABASE TRIGGER; that permission is only necessary when installing or upgrading the SDE master geodatabase.

ADMINISTER DATABASE TRIGGER
ALTER ANY INDEX
ALTER ANY TABLE
ANALYZE ANY
CREATE ANY INDEX
CREATE ANY PROCEDURE
CREATE ANY SEQUENCE
CREATE ANY TRIGGER
CREATE ANY VIEW
CREATE INDEXTYPE
CREATE LIBRARY
CREATE OPERATOR
CREATE PUBLIC SYNONYM
CREATE SESSION
CREATE TABLE
CREATE TYPE
DROP ANY INDEX
DROP ANY PROCEDURE
DROP ANY SEQUENCE
DROP ANY TABLE
DROP ANY VIEW
DROP PUBLIC SYNONYM
EXECUTE ANY PROCEDURE
SELECT ANY SEQUENCE
SELECT ANY TABLE

After the upgrade completes, you may revoke the following permissions from the SDE user or schema owner user account:

ADMINISTER DATABASE TRIGGER
ALTER ANY INDEX
ALTER ANY TABLE
ANALYZE ANY
CREATE ANY INDEX
CREATE ANY SEQUENCE
CREATE ANY TRIGGER
CREATE ANY VIEW
CREATE INDEXTYPE
CREATE LIBRARY
CREATE OPERATOR
CREATE TYPE
DROP ANY INDEX
DROP ANY VIEW
Installing the ArcSDE 64-bit component on Windows

DROP ANY PROCEDURE
DROP ANY SEQUENCE
EXECUTE ANY PROCEDURE
SELECT ANY SEQUENCE
Tablespace size requirements

The minimum tablespace requirement for upgrading is 400 MB. For larger geodatabases, the SDE tablespace requirement may be larger. If you choose to define the SDE user environment using the Post Installation wizard, the wizard will check that your SDE user's default tablespace is at least 400 MB. If the tablespace is less than 400 MB, it will be extended automatically.
Uninstalling the ArcSDE component

Before uninstalling, make a copy of any custom files (such as the dbtune.sde file) you want to keep for future use.

To uninstall the ArcSDE component:

1. From the Start menu, open the Control Panel and double-click the Add or Remove Programs icon.
2. Select ArcSDE for Oracle from the program list, and click the Remove button.
Moving to ArcSDE 64 bit on Windows

There are two different scenarios for an existing ArcSDE installation.

- You are running ArcSDE as a 32-bit application connecting to an existing remote geodatabase in a 64-bit Oracle database on a 64-bit server, or
- You have an existing ArcSDE 32-bit geodatabase in a 32-bit Oracle database, and you want to move the whole thing to a 64-bit server.

Follow the instructions appropriate to your situation. In either case, you need to upgrade your existing ArcSDE geodatabase to 9.3 Service Pack 1 before moving to ArcSDE 64-bit.

If the existing DBMS is already 64-bit, do the following:

1. Create a backup of your existing geodatabase.
2. Stop the ArcSDE service, if one is running. This can be done from the Windows Services menu or using the sdemon command.

   sdemon -o shutdown -i <service> -s <server_name> -p <ArcSDE_administrator_password>

   For details on using the sdemon command, consult the ArcSDE Administration Command Reference (%SDEHOME%\documentation\Admin_Cmd_Ref).
3. Make sure there are no users currently making a direct connection to the geodatabase.
4. Grant upgrade permissions to the ArcSDE administrative user. For most geodatabases, this is the SDE user. For geodatabases created in a user's schema, this is the owner of the schema. See the topic Required Oracle permissions to upgrade for a list of the necessary permissions.
5. Check the size of the SDE user's default tablespace to be sure it is large enough. If it is not, alter it. See the topic Tablespace size requirements for details.
6. Upgrade the geodatabase to ArcSDE (32-bit) 9.3 SP 1. Instructions for this upgrade are provided with the Service Pack 1 download, which is obtained from the ESRI support site.
7. Create a backup of the 9.3 SP1 geodatabase.
8. Make sure there are no connections to the geodatabase.
9. Save the old SDEHOME in case you need it. You may want to copy configuration files (dbtune.sde, dbinit.sde, giomgr.defs) from the old SDEHOME/etc into the new SDEHOME/etc directory.
Installing the ArcSDE 64-bit component on Windows

10. Use the Add or Remove Programs from the Control Panel to uninstall the 32-bit version of the ArcSDE component from the 32-bit server. When prompted, delete the ArcSDE service. (You will create a new one on the 64-bit server.)

11. Install the 64-bit version of the ArcSDE component on a 64-bit server (either the one on which the DBMS resides or a remote one). Follow the instructions in the topic Installing the ArcSDE component or Installing the ArcSDE component and Oracle on separate machines to accomplish this. Do not proceed with the Post Installation wizard.

12. If necessary, modify the configuration files created by the new ArcSDE installation or replace them with the ones from the old SDEHOME directory.

13. If your site uses an ArcSDE service to connect to the geodatabase, run a custom postinstallation setup using the Post Installation wizard on the 64-bit server. Choose only the fourth option and follow the directions in Creating an ArcSDE service to set up the new service.

**If the existing DBMS is 32-bit, do the following:**

1. Check the system requirements on the ESRI support site (http://support.esri.com) to be sure the new configuration you want to use is supported. Navigate to Software > ArcGIS Server > System Requirements.

2. Reconcile all versions in your existing geodatabase with the DEFAULT version.

3. Delete all other versions.

4. Compress the geodatabase.

5. Create a backup of the database.

6. Stop the ArcSDE service, if one is running. This can be done from the Windows Services menu or using the sdemon command.

   ```
   sdemon -o shutdown -i <service> -s <server_name> -p
   <ArcSDE_administrator_password>
   ```

   For details on using the sdemon command, consult the ArcSDE Administration Command Reference (%SDEHOME%\documentation\Admin_Cmd_Ref).

7. Make sure there are no users currently making a direct connection to the geodatabase.

8. Grant upgrade permissions to the ArcSDE administrative user. For most geodatabases, this is the SDE user. For geodatabases created in a user's schema, this is the owner of the schema. See the topic Required Oracle permissions to upgrade for a list of the necessary permissions.

9. Check the size of the SDE user's default tablespace to be sure it is large enough. If it is not, alter it. See the topic Tablespace size requirements for details.
10. Upgrade the geodatabase to ArcSDE (32-bit) 9.3 SP1. Instructions for this upgrade are provided with the Service Pack 1 download, which is obtained from the ESRI support site.

11. Create a backup of the 9.3 SP1 database.

12. If you were using custom configuration files (dbtune.sde, dbinit.sde, giomgr.defs) in the geodatabase on the 32-bit server, you may want to copy these files from the old SDEHOME/etc folder so you can paste them into the new SDEHOME/etc folder on the 64-bit server after you install ArcSDE but before creating a geodatabase on the 64-bit server.

13. Setup a 64-bit version of the Oracle DBMS on a 64-bit server. For details on exact Oracle versions and patch levels supported by each ArcSDE for Oracle installation, see the ArcSDE System Requirements online at http://support.esri.com, and navigate to Software > ArcGIS Server > System Requirements. See the DBMS notes section under each System Requirements entry for any additional setup information.

Also be sure to re-create user accounts in the new database.

14. Install the 64-bit version of ArcSDE on the 64-bit server, following the instructions in the topic Installing the ArcSDE component. Do not proceed with the Post installation setup wizard.

15. Decide how you want to transfer your data. You can either
   - Move the entire database from the 32-bit instance to the 64-bit instance using Oracle tools, such as the Data Pump Export and Import utilities. Or
   - Set up a second geodatabase on the 64-bit instance and use XML workspace documents or copy and paste in ArcGIS, or ArcSDE export files to move the data from the old geodatabase to the new one.

   If you decide to move the entire database, consult the Oracle documentation and use the method you prefer. Then run a custom postinstallation setup using the Post Installation wizard. Choose only the last setup option and follow the instructions in Creating an ArcSDE service to create and start a new ArcSDE service.

   If you decide to set up a second geodatabase and move the data, do the following:

   c. Perform the postinstallation setup using the Post Installation wizard to create a new geodatabase on the 64-bit instance. Follow the instructions in Setting up the SDE user environment, Setting up the geodatabase repository, ArcSDE authorization, and Creating an ArcSDE service to accomplish this. **Note:** If your site uses only direct connections to the geodatabase, you can skip creating an ArcSDE service.

   d. Move the data from the 32-bit geodatabase to the 64-bit geodatabase using XML workspace documents, copy and paste, or ArcSDE export files. **Note:** You should have each user transfer his/her own data so it will be owned by that same user in the new geodatabase.
Installing the ArcSDE 64-bit component on Windows

e. After moving the data, rebuild indexes and update database statistics.

16. After testing to be sure everything is working properly in the new geodatabase, uninstall ArcSDE from the 32-bit server.
Installing the ArcSDE 64-bit component on Linux
Installation Guide: ArcSDE 64 bit for Oracle

ArcGIS Installation Guide

System requirements

ESRI’s ArcSDE 64-bit component has certain minimum computer system requirements. Your computer system is required to meet these minimum requirements to successfully install and use ArcSDE for Oracle.

Which operating system (OS) is supported depends on the release of Oracle and ArcSDE being used. For specifics and the latest information on supported system environments for ArcSDE for Oracle, see http://support.esri.com, and navigate to Software > ArcGIS Server > System Requirements. In general, though, the following are supported for ArcSDE 64-bit for Oracle:

<table>
<thead>
<tr>
<th>PLATFORM</th>
<th>OPERATING SYSTEM</th>
<th>COMPILER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Hat® Linux®</td>
<td>Red Hat Linux AS/ES 4 and 5 64-bit</td>
<td>gcc version 3.2.3 20030502 (Red Hat Linux 3.2.3-47.3)</td>
</tr>
<tr>
<td>SUSE® Linux</td>
<td>SUSE Linux Enterprise 10 64-bit</td>
<td>gcc version 3.2.3 20030502</td>
</tr>
</tbody>
</table>

Higher releases may, and usually do, work. Lower versions of releases are not supported.

**Note:** For any given operating system, if the DBMS is not supported on that version of the operating system, ArcSDE is not supported either.

Disk space

Installation of the ArcSDE component will require approximately 160 MB of disk space.

Oracle requirements

Separate from ArcSDE requirements, Oracle has certain minimum computer system requirements. Your computer system is required to meet these minimum requirements to successfully install and use Oracle. For the latest in Oracle's requirements, consult the Oracle Web site (http://www.oracle.com/index.html).
Preinstallation requirements

The installation of the ArcSDE component on Linux systems requires the following:

- A operating system administrator account that will own the SDEHOME files
- An Oracle SDE account with a default tablespace
- An authorization file to authorize ArcSDE; see ArcSDE authorization

Creating the ArcSDE operating system account on Linux

To install the ArcSDE component for Oracle, you must create an ArcSDE account on your Linux server. By convention, the ArcSDE account is named SDE, but you may use any name. The ArcSDE account must own all ArcSDE system files and directories. Keep the password in strict confidence to maintain system security. Only those users who must administer the ArcSDE system should have access to the ArcSDE login. To create the ArcSDE login, use the system administration procedures outlined by the host operating system. The following is a sample configuration for the ArcSDE administrator account using SDE as the name.

| Login name: | sde |
| User Id: | <Any unused user id> |
| Group Id: | <Any group id> |
| Home Directory: | <home directory for user sde> |
| Default Shell: | /bin/sh or /bin/csh |

Add the following to the SDE user’s .cshrc or .profile file, depending on which shell it will use. By adding the lines below, all ArcSDE administration and utility software programs can be located without specifying absolute paths. Application programs will also be able to find the necessary program files located within the ArcSDE installation directory.

There are several environment variables you should set. For the Bourne shell, add variable definitions to the .profile file. Syntax is:

```bash
<VARIABLE> = <value for variable>
export <VARIABLE>
```

For the C shell, add variable definitions to the .cshrc file (or the SDEHOME/etc/dbinit.sde file). Syntax is:

```bash
setenv <VARIABLE> <variable_value>
```

The list of variables you should set is as follows:
Installation Guide: ArcSDE 64 bit for Oracle

SDEHOME <location of ArcSDE>

ORACLE_HOME <location of Oracle>

ORACLE_SID <Oracle SID value>

TNS_ADMIN  <location of the tnsnames.ora file>

PATH $PATH:$SDEHOME/bin:$ORACLE_HOME/bin

LD_LIBRARY_PATH $SDEHOME/lib:/usr/lib:/lib:$ORACLE_HOME/lib

TWO_TASK <value for TWO_TASK> (if ArcSDE and Oracle on different machines)

SDEFORCEXDR 1 (needs to be set for all 32-bit clients installed on the same machine as ArcSDE 64-bit)

Notes about these environment variables

- The ORACLE_HOME and ORACLE_SID variables locate an Oracle database installed on the local host. However, when the TWO_TASK variable is set, ORACLE_HOME and ORACLE_SID are not used. The TWO_TASK variable identifies the location of a remote Oracle database. The TNS_ADMIN must be set if the default location of the tnsnames.ora file is not used. You do not need to set the TWO_TASK variable if the Oracle database is on the local host.

- You could use the TWO_TASK variable to specify the Net Service Name of a local Oracle database. However, this is not recommended because it results in additional overhead when making a connection to the database. For local connections, you should use the Oracle_SID.

- When the ArcSDE service is started, the giomgr process reads the variable settings in the $SDEHOME/etc/dbinit.sde file. These variable settings override the variables set by .cshrc or .profile files. The role of the dbinit.sde file is further explained in the help topic The dbinit.sde file in the ArcGIS Server and Desktop help.

- SDEFORCEXDR must be set to 1 (true) for any 32-bit client application installed on the same server as the ArcSDE 64-bit component. If it is not set in the connecting client's environment variables, the client will not be able to connect to the geodatabase.

Creating the Oracle SDE user and tablespace

Before you can start the ArcSDE service, you must install and configure the Oracle database and create the Oracle SDE user.

Unlike the ArcSDE for Windows installation, the Linux installation of ArcSDE does not provide any interface for creating the Oracle SDE user or its tablespace. Therefore, the task must be performed using SQL. You may modify and use the createsdeoracle.sql script to manually create the SDE user and tablespace. The createsdeoracle.sql script is located at $SDEHOME/tools/oracle.
Installing the ArcSDE 64-bit component on Linux

Related concepts found in the help

You can get more information related to the SDE user and permissions in the ArcGIS Server help and the ArcGIS Desktop online help (http://webhelp.esri.com/arcgisdesktop/9.3). Use the links below to open the online topics, or open the help and search for the following titles:

The ArcSDE administrative account

User permissions
Installation Guide: ArcSDE 64 bit for Oracle

Installing the ArcSDE component

Follow these steps to install the ArcSDE 64-bit component of ArcGIS Server Enterprise on Linux. Also be sure to read the important notes at the bottom of this topic.

1. Make sure the ArcSDE administrator account, which was created during the preinstallation stage, is used to install the ArcSDE software and that this account has write permissions to the installation directory.

2. Place the ArcSDE component media into the appropriate drive and mount the drive.

3. Change directories into the appropriate database directory.

   % cd /<name_of_drive>/ArcSDE/Linux/ArcSDEOracle<version>64

4. To start the ArcSDE component installation, type the install command at the operating system prompt:

   % ./install -load

   (Note: The usage for the install command is: install <-help | -load | -remove | -verify >. To read more about the installation procedure, type: ./install -help.)

   Running the install command will start the command-driven dialog for the ArcSDE component installation procedure. Default selections are noted in brackets,[ ] . To obtain a list of options or online help, type '?’ at any prompt. You can quit the installation procedure at any time by typing 'quit' or 'q'. To return to a previous question, type the caret, '^[ ]'.

5. Before continuing with the installation, you will be asked to read the license agreement and accept it or exit if you don't agree with the terms. The default is set to "no" and you have to type "yes" to proceed with the installation. The license agreement can be found under the License folder at the root level of the DVD under each platform's installation folder (ArcSDE/<platform>/License). The license agreement also can be viewed in a different language at http://www.esri.com/licenseagreement/. Please read the license agreement file appropriate for your locale.

   ESRI is willing to license the software to you only if you accept and agree to the enclosed license agreement. If you have read and agree with the terms in the enclosed license agreement type 'yes' to continue the installation process, if not press <return> or type 'no' to exit installation process. [no]
Installing the ArcSDE 64-bit component on Linux

Once the installation is complete, please continue with the postinstallation setup.

Important notes for installation

- If ArcSDE 64-bit is installed on the same server as a 32-bit client (for example, ArcGIS Server or ArcIMS), you must set SDEFORCEXDR to 1 (true) in the client system environment variables. If you do not, the client and ArcSDE will attempt to use the same shared memory, and the client's connection to the geodatabase will fail.

- If you are installing ArcSDE on a different server than Oracle, see Installing the ArcSDE component and Oracle on separate machines.

- New installations of ArcSDE 9.3 for Oracle do not install public synonyms for use with ST functions and operators. That means when using ST functions and operators, you must qualify them with the sde schema. For example, you would type "SELECT id, sde.st_is3d (geometry)" rather than "SELECT id, st_is3d (geometry)".

If you are upgrading from a previous release of ArcSDE, the public synonyms will still be present and you do not need to qualify ST functions and operators.
Required Oracle permissions to create the geodatabase

To run sdesetup and create the ArcSDE geodatabase in your Oracle instance, you have to grant the following additional permissions to the SDE user in Oracle for the setup to succeed. On Windows, if you use the Post Installation wizard to create the SDE user, these permissions are granted automatically.

All the same permissions are necessary for the schema owner if creating a user-schema geodatabase, except ADMINISTER DATABASE TRIGGER; that permission is only necessary when installing or upgrading the SDE master geodatabase.

<table>
<thead>
<tr>
<th>Permission</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADMINISTER DATABASE TRIGGER</td>
</tr>
<tr>
<td>CREATE SESSION</td>
</tr>
<tr>
<td>CREATE TABLE</td>
</tr>
<tr>
<td>CREATE TRIGGER</td>
</tr>
<tr>
<td>CREATE PROCEDURE</td>
</tr>
<tr>
<td>CREATE INDEXTYPE</td>
</tr>
<tr>
<td>CREATE LIBRARY</td>
</tr>
<tr>
<td>CREATE OPERATOR</td>
</tr>
<tr>
<td>CREATE PUBLIC SYNONYM</td>
</tr>
<tr>
<td>CREATE SEQUENCE</td>
</tr>
<tr>
<td>CREATE TYPE</td>
</tr>
<tr>
<td>CREATE VIEW</td>
</tr>
<tr>
<td>DROP PUBLIC SYNONYM</td>
</tr>
</tbody>
</table>

If you plan to use autoregistration for SDO_GEOMETRY tables, you must also grant the SDE user SELECT ANY TABLE. Note: The SELECT ANY TABLE privilege is also required for the SDE user to run a geodatabase compress operation. You can grant the SDE user that privilege now, or wait to grant it prior to each compress operation.

For an explanation of why each of these are needed, see the topic User permissions for geodatabases in Oracle in the ArcGIS Server or ArcGIS Desktop help.

After the geodatabase has been created, you may revoke the following permissions from the SDE user or schema owner user account:

<table>
<thead>
<tr>
<th>Permission</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADMINISTER DATABASE TRIGGER</td>
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<tr>
<td>CREATE INDEXTYPE</td>
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</tr>
<tr>
<td>CREATE VIEW</td>
</tr>
<tr>
<td>DROP PUBLIC SYNONYM</td>
</tr>
</tbody>
</table>

The Oracle SYS user must also grant EXECUTE permissions on a number of packages to the PUBLIC role. These permissions cannot be revoked.

`sqlplus sys/*****`
GRANT EXECUTE ON dbms_pipe TO public;

GRANT EXECUTE ON dbms_lock TO public;

ArcSDE uses DBMS_PIPE to store row ids during the insert process and uses DBMS_LOCK to mark entries in the PROCESS_INFORMATION table as active. Access for PUBLIC is required because these packages are used both directly and via definers-rights stored procedures. A stored procedures with definers-rights cannot use permission from roles.

See Creating the SDE user and tablespace script.
ArcSDE postinstallation setup on Linux

After your ArcSDE component is installed and before you attempt to start the ArcSDE service, you must complete the postinstallation setup.

To successfully complete the postinstallation setup, perform the following steps:

1. **Modify files in $SDEHOME/etc and /etc.**
   
   Once the ArcSDE component is installed, you need to modify one or more files.

   - **/etc/services**—This is a system file that requires root access to change. You will need to add a line to that file defining the TCP/IP port number and name to use for your ArcSDE service. Add a line similar to the following:

     ```
     esri_sde 5151/tcp # ArcSDE service on pinetree
     ```

     Users connecting to your service can use the TCP/IP port number 5151 as the service name. If they prefer to use the name esri_sde, they will need to add this same line to their local system services file.

   - **$SDEHOME/etc/services.sde**—Enter the same line in this file that you entered for the /etc/services.

   - **$SDEHOME/etc/services.sde**—Enter the same line in this file that you entered for the /etc/services.

   - Other configuration files in $SDEHOME/etc you may want to edit include:

     - **dbinit.sde**—In this file, you can set variables the application server will use. Syntax is:

       ```
       set <variablename>=<value>
       ```

       See the ArcGIS Server and Desktop help topic The dbinit.sde file for more information.

     - **giomgr.defs**—This file contains parameters that define how ArcSDE uses memory. The default parameters are usually sufficient for most applications. This file gets loaded into the database as a table called SERVER_CONFIG as part of the sdesetup command (step 3). For more information on the giomgr.defs file, see the ArcGIS Server and Desktop help topic The giomgr.defs file and the SERVER_CONFIG system table. To modify these settings after running the sdesetup command, see the sdeconfig command in the ArcSDE Administration Command Reference.

     - **dbtune.sde**—This file controls the physical storage parameters for tables in the database. This file gets loaded into the database as a table called DBTUNE as part of the sdesetup command (next step). For more information, see the ArcGIS Server and Desktop help topic The dbtune file and the DBTUNE table. To modify these settings after
Installing the ArcSDE 64-bit component on Linux

running the sdesetup command, see the sdedbtune command in the ArcSDE Administration Command Reference.

2. **Grant execute privileges.**

Make sure the PUBLIC role has EXECUTE privileges on the dbms_pipe and dbms_lock packages. As the Oracle SYS user, execute the following SQL commands:

```sql
sqlplus sys/******** as sysdba
GRANT EXECUTE ON dbms_pipe TO public;
GRANT EXECUTE ON dbms_lock TO public;
```

3. **Run $SDEHOME/bin/sdesetup.**

The sdesetup command must be run by the SDE user. See Required Oracle permissions to create the geodatabase for a list of privileges required for the SDE user to run sdesetup.

The sdesetup command does the following:

- Creates all the ArcSDE and geodatabase system tables in the DBMS.
- Creates ArcSDE stored procedures.
- Populates the LOCATORS and METADATA system tables with data from $SDEHOME/geocode/templates.

The sdesetup command must execute successfully for ArcSDE to function correctly.

The usage for the sdesetup -o install command is as follows:

```
-o install -d <ORACLE10G|ORACLE11G> [-H <sde_directory>]
[-u <DB_Admin_user>] [-p <DB_Admin_password>] [-s <datasource>]
[-i <master_gdb_service>:<user_schema>] [-N] [-l <key>] [-q]
```

Where:

- `-o install` Creates geodatabase tables and procedures ArcSDE requires
- `-d` Underlying RDBMS used to store the ArcSDE geodatabase
- `-H` Location where ArcSDE files are installed (not required if $SDEHOME is set)
- `-i` Only used for a user-schema geodatabase; consisting of the port number for the master SDE geodatabase followed by the schema name (for example, 5151:tyort).
- `-l` ArcSDE authorization key or location to authorization file
Installation Guide: ArcSDE 64 bit for Oracle

-N No verification
-o Operation
-p DBMS DBA user password
-q Quiet; all titles and warnings are suppressed.
-s Datasource name
-u DBMS DBA user name

For example, this command sets up the geodatabase in an Oracle 11g database on a remote server, gisdb:

```
sdesetup –o install –d ORACLE11G –s gisdb –u sde –l /usr/sde/server93_Emp.ecp
```

Please enter ArcSDE DBA password:

For more information on the sdesetup command, consult the ArcSDE Administration Command Reference ($SDEHOME/documentation/Admin_Cmd_Ref).

To authorize the software, use the -l <key> option during with the install operation. To authorize ArcSDE later, use the update_key operation. For additional information see ArcSDE authorization.

Related concepts found in the help

You can get more information related to setting up the repository in the ArcGIS Desktop online help (http://webhelp.esri.com/arcgisdesktop/9.3) or the help system installed with ArcGIS Server or ArcGIS Desktop. Use the links below to open the online topics, or open the help and search for the following titles:

The dbtune file and the DBTUNE table
DBTUNE configuration keywords
DBTUNE configuration parameter name-configuration string pairs
About geometry storage types
A spatial type for Oracle
The ST_Geometry storage type
Using the Oracle Spatial geometry type
ArcSDE Compressed Binary storage
The OGC Well-Known Binary representation for geometry
The giomgr.defs file and the SERVER_CONFIG table
The dbinit.sde file
System tables of a geodatabase stored in Oracle
ArcSDE authorization


To authorize the ArcSDE component for use, you must obtain an authorization file from ESRI Customer Service (.ecp file). For more information on obtaining an authorization file see: https://service.esri.com

Every ArcSDE geodatabase that resides on the same machine must be authorized using the authorization file because the authorization information is stored in the geodatabase repository. This includes geodatabases stored in the schemas of users other than the SDE schema. You will not be able to make any connections to the geodatabase unless your geodatabase repository has been configured using a valid authorization file.

You can register ArcSDE with an authorization file in two ways:

1. If you already have your authorization file, run the sdesetup command with the install or upgrade operation and specify the authorization key information with the -l option. See ArcSDE postinstallation setup.

2. If you don't yet have your authorization file, you can run the sdesetup command with either the install or upgrade operation but without the -l option. Then when you receive your authorization file from ESRI, run sdesetup again using the update_key operation and the -l option.

The syntax for the sdesetup command with the update_key operation is as follows:

```
sdesetup -o update_key -d <ORACLE10G|ORACLE11g> -l <key> 
[-u <DB_Admin_user>] [-p <DB_Admin_password>]
[-H <sde_directory>] [-D <database>] [-s datasource]
[-i <service>] [-N] [-q]
```

Where <key> is the authorization key information or the location of your authorization file

For example:

```
sdesetup -o update_key -d ORACLE10G -l /machine/keycode.txt -u sde -p sde
```

More information on the sdesetup command can be obtained from the ArcSDE Administration Command Reference.
Starting an ArcSDE service on Linux

An ArcSDE service can be created and started. Start the ArcSDE service by logging in as the ArcSDE administrator and using the sdemon command.

```bash
sde on edsel > sdemon -o start -i 4000
```

Please enter ArcSDE DBA password: <enter your Oracle sde password here>

Once the service is accepting connections, it is ready for use.

If you encounter problems starting the service, consult the topic Troubleshooting the ArcSDE service in the ArcGIS Server or Desktop help. This help topic is also available from http://webhelp.esri.com/arcgisdesktop/9.3/index.cfm.

For more information on the sdemon command, see the ArcSDE Administration Command Reference ($SDEHOME/documentation/Admin_Cmd_Ref).

Related concepts found in the help

You can get more information related to the ArcSDE service in the ArcGIS Desktop online help (http://webhelp.esri.com/arcgisdesktop/9.3) or the help system installed with ArcGIS Server or ArcGIS Desktop. Use the links below to open the online topics, or open the help and search for the following titles:

- An overview of ArcSDE geodatabase connections
- Stopping an ArcSDE service
- Pausing and resuming an ArcSDE service
- Accessing an ArcSDE service through a firewall
- Troubleshooting the ArcSDE service
Installing the ArcSDE component and Oracle on separate servers

If you are installing the ArcSDE component on a different server than Oracle, there are additional steps you must take.

1. Make sure Oracle is installed and running on the remote server.

2. Install the Oracle Net Software on the server where ArcSDE is to be installed. Ensure SQL will operate from this remote machine to the Oracle server.

3. Copy the shared libraries used by EXTPROC to the Oracle server. These libraries include st_shapelib plus the Geometry library and the Projection Engine library. (The names of these files vary depending on what operating system (OS) you are using.) Be sure the files copied to the Oracle server are designed to run on the operating system of the Oracle server. For example, if ArcSDE is installed on a Linux machine, but Oracle is installed on a Solaris machine, the dll and lib files you copy to the Oracle server must be for Solaris. To get the files for different operating system, you can install the software files of the ArcSDE component on the Oracle server, creating the SDEHOME files, and delete everything but the three required library files.

4. These files can be found in the bin (Windows) or lib (UNIX/Linux) directory of SDEHOME after you’ve installed the ArcSDE component. You can copy these files to the %ORACLE_HOME%\lib (Windows) or $ORACLE_HOME/lib (UNIX/Linux) directory on the Oracle server, which is the default location that Oracle looks in for shared libraries. Or, you can leave these files where they are.

<table>
<thead>
<tr>
<th>Library name</th>
<th>OS-dependent file names</th>
</tr>
</thead>
<tbody>
<tr>
<td>st_shapelib</td>
<td>st_shapelib.dll (Windows), libst_shapelib.so (Solaris, Linux, HP-UX Itanium), libst_shapelib_64.so (IBM), or libst_shapelib.sl (HP-UX PA-RISC)</td>
</tr>
<tr>
<td>Projection Engine</td>
<td>pe.dll (Windows), libpe.so (Solaris, Linux, HP-UX Itanium), libpe_64.so (IBM) or libpe.sl (HP-UX PA-RISC)</td>
</tr>
<tr>
<td>Geometry</td>
<td>sg.dll (Windows), libsg.so (Solaris, Linux, HP-UX Itanium), libsg_64.so (IBM) or libsg.sl (HP-UX PA-RISC)</td>
</tr>
</tbody>
</table>
5. If you do not use the default location under ORACLE_HOME for the library files, you will need to define the environment variable EXTPROC_DLLS for the EXTPROC so it can find st_shapelib. This is done in the listener configuration file listener.ora. See Configuring Oracle Net Services to use ST_Geometry SQL functions for more information.

6. The library definition in the Oracle data dictionary must be updated with the correct library path to the file containing st_shapelib. Altering the definition of the library path will invalidate package bodies that refer to it, so the package bodies of some ArcSDE stored procedure packages should be recompiled using Oracle.

7. Perform the preinstallation tasks and install the ArcSDE component on the ArcSDE server as described in the topics Installing the ArcSDE component (Windows) or Preinstallation requirements and Installing the ArcSDE component (UNIX/Linux).

8. Perform the ArcSDE postinstallation steps as described in the topics relevant to each OS.
   - **Windows**
     
     Postinstallation overview, Setting up the SDE user environment, Setting up the geodatabase repository, and ArcSDE authorization

     To create the service on Windows, you must use the sdeservice -o create command. The Post Installation wizard is not designed to create a service for ArcSDE setups that are on a remote server.

     The -d option for the sdeservice is required and you must enter the name of the Oracle Instance (SID). However, since it is not possible for a Windows service to have a dependency on a service that is on a remote server, you will need to add to the sdeservice syntax the -n parameter to negate the dependency.

     At a command prompt, type sdeservice -h for syntax information or refer to the ArcSDE Administration Command Reference for syntax and explanation of the sdeservice command.

   - **UNIX/Linux**
     
     ArcSDE postinstallation setup, ArcSDE authorization, and Starting the ArcSDE service on UNIX

9. For Oracle to connect to a remote instance, an environment variable must be set to identify the remote Oracle instance through the net service name.

   If the ArcSDE server is on Windows, set LOCAL to the Oracle net service name in the SDEHOME\etc\dbinit.sde file. If the ArcSDE server is on UNIX, set TWO_TASK to the Oracle net service name. The ORACLE_HOME variable must also be set. Consult your Oracle documentation for further information on these environment variables.
Installing the ArcSDE 64-bit component on Linux

**Note:** You could use the TWO_TASK or LOCAL variable to specify the Net Service Name of a local Oracle database. However, this is not recommended because it results in additional overhead when making a connection to the database. For local connections, you should use the Oracle_SID.

10. The TNS_ADMIN variable must be set if the default location of the tnsnames.ora file is not used.

**Related concepts found in the help**

You can get more information related to the SDE user and permissions in the ArcGIS Desktop online help ([http://webhelp.esri.com/arcgisdesktop/9.3](http://webhelp.esri.com/arcgisdesktop/9.3)) or the help system installed with ArcGIS Server or ArcGIS Desktop. Use the links below to open the online topics, or open the help and search for the following titles:

- Configuring Oracle Net Services to use SQL functions
- The dbinit.sde file
The next steps

After you finish the postinstallation setup, you're ready to add other users, set up client connections, and add data to your geodatabase. The following is a list of help topics to assist you in these tasks. Topics can be found in the ArcGIS Desktop online help (http://webhelp.esri.com/arcgisdesktop/9.3) or the help system installed with ArcGIS Server or ArcGIS Desktop. Use the links below to open the online topics, or open the help and search for the titles.

<table>
<thead>
<tr>
<th>TASK</th>
<th>RELATED TOPICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geodatabase users</td>
<td>Adding users to an ArcSDE geodatabase</td>
</tr>
<tr>
<td></td>
<td>User permissions</td>
</tr>
<tr>
<td></td>
<td>Grouping users by access needs</td>
</tr>
<tr>
<td>Client connections</td>
<td>Configuring Oracle Net Services to use SQL functions</td>
</tr>
<tr>
<td></td>
<td>An overview of ArcSDE geodatabase connections</td>
</tr>
<tr>
<td></td>
<td>Setting up clients for a direct connection</td>
</tr>
<tr>
<td></td>
<td>Creating spatial database connections</td>
</tr>
<tr>
<td>Adding data</td>
<td>An overview of adding datasets to the geodatabase</td>
</tr>
</tbody>
</table>
Uninstalling the ArcSDE component

Uninstalling an existing version of the ArcSDE component consists of the following:

1. Stopping the service

   sdemon -o shutdown -i 4000

2. Using an operating system command to remove the software

   rm -r $SDEHOME

   You may also want to remove the service entry from the /etc/services file.

These two steps stop the service and remove the software from disk. The ArcSDE geodatabase system tables, stored procedures, and user data are still in your Oracle database. If upgrading, leave them there and see the topic Upgrading an ArcSDE geodatabase.
Moving to ArcSDE 64 bit on Linux

There are two different scenarios for an existing ArcSDE installation.

- You are running ArcSDE as a 32-bit application connecting to an existing remote geodatabase in a 64-bit Oracle database on a 64-bit server, or
- You have an existing ArcSDE 32-bit geodatabase in a 32-bit Oracle database, and you want to move the whole thing to a 64-bit server.

Follow the instructions appropriate to your situation. In either case, you need to upgrade your existing ArcSDE geodatabase to 9.3 Service Pack 1 before moving to ArcSDE 64-bit.

If the existing DBMS is already 64-bit, do the following:

1. Create a backup of your existing geodatabase.
2. Stop the ArcSDE service, if one is running.
   
   `sdemon -o shutdown -i <service> -s <server_name> -p <ArcSDE_administrator_password>`

   For details on using the sdemon command, consult the ArcSDE Administration Command Reference.
3. Make sure there are no users currently making a direct connection to the geodatabase.
4. Grant upgrade permissions to the ArcSDE administrative user. For most geodatabases, this is the SDE user. For geodatabases created in a user's schema, this is the owner of the schema. See the section Required Oracle permissions to upgrade in this topic for a list of the necessary permissions.
5. Check the size of the SDE user's default tablespace to be sure it is large enough. If it is not, alter it. See the section Tablespace size requirements in this topic for details.
6. Upgrade the geodatabase to ArcSDE (32-bit) 9.3 SP1. Instructions for this upgrade are provided with the Service Pack 1 download, which is obtained from the ESRI support site.
7. Create a backup of the 9.3 SP1 geodatabase.
8. Follow the instructions in Preinstallation requirements to set up the 64-bit server for an ArcSDE installation.
9. Install the 64-bit version of the ArcSDE component to a 64-bit server (either the one on which the DBMS resides or a remote one). Follow the instructions
Installing the ArcSDE 64-bit component on Linux

in the topic Installing the ArcSDE component or Installing the ArcSDE component and Oracle on separate machines to accomplish this.

10. If your site uses an ArcSDE service to connect to the geodatabase, start an ArcSDE application server (service) on the 64-bit server using the sdemon -o start command.

11. After testing to be sure everything is working properly in the new geodatabase, uninstall ArcSDE from the 32-bit server.

If the existing DBMS is 32-bit, do the following:

1. Reconcile all versions with the DEFAULT version.
2. Delete the other versions.
3. Compress the geodatabase.
4. Create a backup of the database.
5. Stop the ArcSDE service, if one is running.

```
    sdemon -o shutdown -i <service> -s <server_name> -p <ArcSDE_administrator_password>
```

For details on using the sdemon command, consult the ArcSDE Administration Command Reference.

6. Make sure there are no users currently making a direct connection to the geodatabase.

7. Grant upgrade permissions to the ArcSDE administrative user. For most geodatabases, this is the SDE user. For geodatabases created in a user's schema, this is the owner of the schema. See the section Required Oracle permissions to upgrade in this topic for a list of the necessary permissions.

8. Check the size of the SDE user's default tablespace to be sure it is large enough. If it is not, alter it. See the section Tablespace size requirements in this topic for details.

9. Upgrade the geodatabase to ArcSDE (32-bit) 9.3 SP1. Instructions for this upgrade are provided with the Service Pack 1 download, which is obtained from the ESRI support site.

10. Create a backup of the 9.3 SP1 database.

11. If you were using custom configuration files (dbtune.sde, dbinit.sde, giomgr.defs) in the geodatabase on the 32-bit server, you may want to copy these files from the old SDEHOME\etc directory so you can paste them into the new SDEHOME\etc directory folder on the 64-bit server after you install ArcSDE but before creating a geodatabase on the 64-bit server.

12. Setup a 64-bit version of the Oracle DBMS on a 64-bit server. For details on exact Oracle versions and patch levels supported by each ArcSDE for Oracle installation, see the ArcSDE System Requirements online at
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http://support.esri.com, and navigate to Software > ArcGIS Server > System Requirements. See the DBMS notes section under each System Requirements entry for any additional setup information.

Also be sure to re-create user accounts in the new database.

13. Install the 64-bit version of ArcSDE on the 64-bit server, following the instructions in the topics Preinstallation requirements and Installing the ArcSDE component.

14. Decide how you want to transfer your data. You can either

- Move the entire database from the 32-bit instance to the 64-bit instance using Oracle tools, such as the Data Pump Export and Import utilities. Or

- Set up a second geodatabase on the 64-bit instance and use XML workspace documents or copy and paste in ArcGIS, or ArcSDE export files to move the data from the old geodatabase to the new one.

If you decide to move the entire database, consult the Oracle documentation and use the method you prefer. Then start an ArcSDE service (if using one) using the sdemon -o start command.

If you decide to set up a second geodatabase and move the data, do the following:

1. Perform the postinstallation setup as described in ArcSDE postinstallation setup on Linux, ArcSDE authorization, and Starting an ArcSDE service to create a geodatabase in the new 64-bit Oracle instance. Note: If your site uses only direct connections to the geodatabase, you can skip starting an ArcSDE service.

2. Move the data from the 32-bit geodatabase to the 64-bit geodatabase using XML workspace documents, copy and paste, or ArcSDE export files. Note: You should have each user transfer his/her own data so it will be owned by that same user in the new geodatabase.

3. After moving the data, rebuild indexes and update database statistics.

14. After testing to be sure everything is working properly in the new geodatabase, uninstall ArcSDE from the 32-bit server.

**Required Oracle permissions to upgrade**

To upgrade your Oracle instance, you will also have to grant the following additional permissions to the SDE user in Oracle for the upgrade to succeed. All the same permissions are necessary for the schema owner if upgrading a user-schema geodatabase, except ADMINISTER DATABASE TRIGGER; that permission is only necessary when installing or upgrading the SDE master geodatabase.

- ADMINISTER DATABASE TRIGGER
- ALTER ANY INDEX
- ALTER ANY TABLE
Installing the ArcSDE 64-bit component on Linux

ANALYZE ANY
CREATE ANY INDEX
CREATE ANY PROCEDURE
CREATE ANY SEQUENCE
CREATE ANY TRIGGER
CREATE ANY VIEW
CREATE INDEXTYPE
CREATE LIBRARY
CREATE OPERATOR
CREATE PROCEDURE
CREATE PUBLIC SYNONYM
CREATE SESSION
CREATE TABLE
CREATE TYPE
DROP ANY INDEX
DROP ANY PROCEDURE
DROP ANY SEQUENCE
DROP ANY TABLE
DROP ANY VIEW
DROP PUBLIC SYNONYM
EXECUTE ANY PROCEDURE
SELECT ANY SEQUENCE
SELECT ANY TABLE

After the upgrade completes, you may revoke the following permissions from the SDE (or schema-owner) user account:

ADMINISTER DATABASE TRIGGER
ALTER ANY INDEX
ALTER ANY TABLE
ANALYZE ANY
CREATE ANY INDEX
CREATE ANY SEQUENCE
CREATE ANY TRIGGER
CREATE ANY VIEW
CREATE INDEXTYPE
CREATE LIBRARY
CREATE OPERATOR
CREATE TYPE
DROP ANY INDEX
DROP ANY TABLE
DROP ANY VIEW
DROP ANY PROCEDURE
DROP ANY SEQUENCE
EXECUTE ANY PROCEDURE
SELECT ANY SEQUENCE

For the ArcSDE for Oracle installation, the Oracle SYS user must also grant execute permissions on a number of packages to the public role:

sqlplus sys/***** as sysdba

grant execute on dbms_pipe to public;
grant execute on dbms_lock to public;
You may modify and use the createsdeoracle.sql script to manually create the SDE user and tablespace. The createsdeoracle.sql script is located at $SDEHOME/tools/oracle.

**Tablespace size requirements**

The minimum tablespace requirement for upgrading ArcSDE is 400 MB. For larger databases, especially large geodatabases, the SDE tablespace requirement may be larger.