ESRI Product Document

ArcSDE 8.1 Questions and Answers

1. What is ArcSDE 8.1?

ESRI® ArcSDE™ software is the GIS gateway that facilitates managing spatial data in a database management system (DBMS). ArcSDE allows you to manage geographic information in one of four commercial databases (IBM DB2 Universal Database, Informix, Microsoft SQL Server 7.0 and 2000, Oracle8, and Oracle8*i*), as well as being able to serve ESRI's file-based data with ArcSDE for Coverages. ArcSDE serves spatial data to the ArcGIS™ 8 Desktop products (ArcView® 8.1, ArcEditor™, and ArcInfo™) and through ArcIMS® 3, as well as other applications, and it is the key component in managing a multiuser spatial database.

If a DBMS vendor provides support for spatial types and functions in his/her DBMS, such as IBM DB2 Spatial Extender, Informix Spatial DataBlade, or Oracle Oracle8*i* Spatial, ArcSDE will utilize it. When the DBMS does not provide spatial types and functions (e.g., Microsoft SQL Server or Oracle8 and Oracle8*i* Standard Edition), ArcSDE can extend the DBMS with spatial types and functions.

2. What were the key goals for ArcSDE 8.1?

There were three primary goals for the 8.1 release.

a. Provide better support for distributed databases.

b. Provide additional database support.

c. Improve integration with ArcGIS 8.1 Desktop products and ArcIMS 3.1 as needed.

3. What are the key new features of ArcSDE 8.1?

- Adds support for IBM DB2 Universal Database with the DB2 Spatial Extender and Informix Dynamic Server with the Spatial DataBlade
- Adds client support on Red Hat Linux version 6.2 for Intel 32-bit processors with Oracle8*i* releases 1 and 2 (e.g., 8.1.5 and 8.1.6)
- Enables read-only replication for SQL Server
- Enables hot fail-over for high-availability systems using parallel or clustered DBMS servers
- Enables standby databases for high-availability systems using backup DBMS instances in recovery mode
- Supports the integration of DBMS-based raster data management in the ArcGIS 8.1 Desktop products
- Supports the integration of serverside geocoding in the ArcGIS 8.1 Desktop products
- Replaces the Java Native Interface (JNI)-based Java client application programming interface (API) with a native Java client API

- Updates the supported coordinate reference systems to the latest EPSG specification

4. What are the other new features of ArcSDE 8.1?

- Improved scalability of version queries
- Faster ArcGIS 8 annotation access and faster business table binary large object (BLOB) access
- Improved installation on Windows NT/2000
- Improved performance with raster data
- "Direct connect" support for Microsoft SQL Server and Oracle8*i*
- More functions provided for multiversion view access with Oracle8*i*
- Support for multiversion view access with Microsoft SQL Server 2000, which provides access to a specific version from a non-ESRI client
- New projections and datums
- Improved support for Oracle8*i* Spatial, including automatic discovery of Oracle8*i* Spatial tables (no more manual registration), moving the spatial type onto the business table, support of the new R-tree index, support of Oracle's Coordinate Reference, support of Oracle's Linear Reference System (LRS), and support of curve-based data types

5. How is ArcSDE 8.1 packaged?

At 8.1 there will once again be an ArcSDE box. This box will contain the ArcSDE 8.1 installation media and documentation and will be included with the ArcGIS 8.1 Desktop box set or be available as a stand-alone package. The contents of the box are as follows:

- **Printed Documentation**

  - *Understanding ArcSDE*
  - *Managing ArcSDE Services*

- **Software Media Kit**

  - (CD #1) 8.1 for IBM DB2
  - (CD #2) 8.1 for Informix
  - (CD #3) 8.1 for Microsoft SQL Server 7.0 and 2000
  - (CD #4) 8.1 for Oracle 8.0.6
  - (CD #5) 8.1 for Oracle8*i*
  - (CD #6) 8.1 for Coverages
  - (CD #7) 8.1 Client (C API, Java API, ArcSDE CAD Client, ArcView Database Access, and MapObjects® update for 2.0a)
  - (CD #8) ArcGIS StreetMap™ USA

- **Other Materials**

- Implementation Services flyer
- GIS Educational Services flyer
- Developer Support Group flyer
- Welcome letter

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6. What are the supported OS and DBMS platforms at 8.1?

The enclosed tables reflect the information that was current at the time that this document was written. Refer to ArcOnline at www.esri.com for the latest information.

ArcSDE 8.1 for DB2 UDB

DBMS	Platform (Operating System)	Support Level
DB2 Universal Database Version 7.1	IBM RISC/6000, AIX Rev 4.3.3	1
DB2 Universal Database Version 7.1	Intel Windows NT 4.0 (SP 6a)	1
DB2 Universal Database Version 7.1	Intel Windows 2000	1

ArcSDE 8.1 for Informix

DBMS	Platform (Operating System)	Support Level
Informix 9.21.TC4	Intel Windows NT 4.0 (SP 6a)	1
Informix 9.21.UC4	Sun Solaris 2.7	1
Informix 9.21.HC4	HP_UX B.11.00	1
Informix 9.21.UC4	IBM AIX 4.3.3.0	1
Informix 9.21.TC4	Intel Windows 2000	1

ArcSDE 8.1 for Microsoft SQL Server

Platform	SQL Server 2000 Enterprise	SQL Server 2000 Standard	SQL Server 2000 Desktop	SQL Server 7.0 Enterprise	SQL Server 7.0 Standard	SQL Server 7.0 Desktop
Windows 2000 DataCenter	Coming Soon!	3	3	3	3	3
Windows 2000 Advanced Server	1	3	3	3	3	3
Windows 2000 Server	N/A	1	3	N/A	1	3
Window 2000 Professional	N/A	N/A	Yes	N/A	N/A	1
Windows NT 4.0 Enterprise	1	3	3	1	3	3
Windows NT 4.0. Server	N/A	1	3	N/A	1	3
Windows NT 4.0 Workstation	N/A	N/A	1	N/A	N/A	1

ArcSDE 8.1 for Oracle

Platform	Standard & Enterprise Edition 8.0.6	Standard & Enterprise Edition 8.1.5	Standard & Enterprise Edition 8.1.6	Standard & Enterprise Edition 8.1.7
Intel NT 4.0 (SP 6a)	1	2 (Spatial Type N/S)	1	3
Windows 2000	5	5	1	3
Compaq Tru64 5.0	1	2 (Spatial Type N/S)	1	3
HP_UX 11.0 (32 bit only)	1	2 (Spatial Type N/S)	1	3
AIX 4.3.3	1	2 (Spatial Type N/S)	1	3
Silicon Graphics, IRIX 6.5	1	5 (No ArcSDE 8.1 support planned for Oracle8*i* on SGI)	5 (No ArcSDE 8.1 support planned for Oracle8*i* on SGI)	5 (No ArcSDE 8.1 support planned for Oracle8*i* on SGI)
Sun Solaris 2.7	1	2 (Spatial Type N/S)	1	1
Sun Solaris 8 (32 bit only)	3	2 (Spatial Type N/S)	1	1
Sun Solaris 8 (64 bit only)	5	5	2	2

IMPORTANT NOTES to supported OS and DBMS:

A. Environment support level.

Level	Support Type
1 Fully supported	Fully supported, tested at ESRI.
2 Supported with limitations	Supported with limitations. Environment may not be available at ESRI.
3 Untested	Has not been tested at ESRI. Assumed to work.
4 Unknown	Unknown.
5 Not supported	Not supported.

Note: Refer to arconline.esri.com/arconline/phd/reports/supportlevels.cfm for a further description of the numeric support-level ratings.

B. "N/S" means not supported.

C. "N/A" means not available.

D. A word about 64-bit operating systems:

ArcSDE is built as a 32-bit application on 32-bit operating systems (except for Compaq Tru64). We have mixed reports from the field regarding using ArcSDE with 64-bit Oracle. Therefore, this configuration is not supported. If you have a 64-bit operating system and it is not Tru64 or Solaris 8, you will need to either (a) use a 32-bit version of Oracle as long as the operating

system vendor guarantees 32-bit compatibility with a 64-bit OS or (b) put ArcSDE on a second machine and use Net8 for connectivity to the 64-bit Oracle instance. With ArcSDE 8.1, you could also use the direct connect configuration to connect to your 64-bit Oracle8*i* instance. Be sure, however, that you are connecting to a supported version of Oracle (e.g., 8.1.6).

7. Are there any changes to the way ArcSDE is licensed at 8.1?

On December 1, 2000, ESRI changed ArcSDE from a client/server license model to a new server/processor licensing model. Also in December 2000, commercial application service provider (ASP) licensing became available for ArcSDE. Please contact your U.S. regional office or international distributor for further information.

8. Are there any changes in client connection licensing at 8.1?

ESRI now has a mix of both next generation client software that can connect to an ArcSDE server without the need for a connection license (ArcView 8.1, ArcEditor 8.1, and ArcInfo 8 and ArcIMS 3, as well as custom applications developed with ArcObjects) and older client software (ArcView GIS 3.2a, MapObjects 2.0a and 2.1, and ArcSDE CAD Client, as well as custom applications developed with the ArcSDE C API or Java API) that still requires an ArcSDE connection license.

Given the possibility that a customer site could have a mix of client software that does and does not require a client connection license, ESRI decided to discontinue the use of a license manager to control the checkout of ArcSDE client and server licenses.

Note: It is important not to confuse our software licensing policy with our software protection mechanism. FLEXlm is the software protection mechanism that we used. FLEXlm is called a "license manager." ArcSDE customers are licensed contractually based on the terms and conditions of their license agreements. So, even though a license manager is no longer used to manage a customer's ArcSDE client and server licenses, it is still each customer's responsibility to ensure that their servers and end users are licensed correctly.

9. Under the new server/processor license model, ESRI now allows customers to run unlimited ArcSDE application servers on the same physical server. Is this policy retroactive to 8.0.2, and, if so, how will it be implemented?

If you will not be immediately upgrading to ArcSDE 8.1 for some reason but would still like the ability to run two or more ArcSDE 8.0.2 application servers on the same physical server, the new policy is retroactive to ArcSDE 8.0.2, as well as SDE® 3.0.2.x. Please contact your regional customer service representative, or if you are outside the United States, contact your local distributor, and they will submit a keycode request for you. Once your request is processed, you will be issued an additional temporary server keycode.

10. With the new server/processor model, does the license manager somehow determine the number of CPUs on the server?

No, the license manager at ArcSDE 8.1 will not know how many processors are on the server. It is each customer's responsibility to ensure that they are licensed correctly. ESRI regional office and distributor account managers are prepared to help any customers that have concerns over whether they are licensed properly.

11. If I am an existing ArcSDE customer site, how does this change to server/processor licensing affect me?

All current ArcSDE customers are "grandfathered" into the new server/processing license model. In other words, the new licensing will only apply to new customers or to existing customers when they purchase additional ArcSDE licenses after November 30, 2000.

12. If a license manager is no longer used at ArcSDE 8.1 to manage a pool of server and client connection licenses, what is it used for?

The FLEXlm license manager is used to

a. Allow ArcSDE services to start. If your ArcSDE service will not start, no user connections can be made to the ArcSDE application server.

b. Allow read–write access to spatial databases.

13. I have heard about a direct connection at 8.1; could you explain what this is?

All core ESRI clients at 8.1 will have the capability to establish a read-only, direct connection to spatial data in an Oracle (Oracle Spatial Geometry Type, Oracle Spatial Normalized Schema, or ArcSDE Compressed Binary) or SQL Server (ArcSDE Compressed Binary) database as part of each product's base configuration.

An ArcSDE license is required to load or edit data and provides the option to establish either a read-only connection through an ArcSDE application server, a read–write direct connection, or a read–write connection through an ArcSDE application server or use a mixture of direct connections and connections through an application server.

Using a direct connection from a client application means you are connecting directly to the spatial database without an ArcSDE application server. The direct connect technology is built from ArcSDE, but it is deployed differently in that the server functionality is performed on the client workstation instead of the server.

Every previous SDE and ArcSDE release has featured three-tiered architecture where there has been a separate process, the ArcSDE application server, sitting between the client application and the DBMS. With this three-tiered architecture, all client applications have been required to connect through the ArcSDE application server. The role of the application server is to provide load balancing by off-loading some of the spatial query processing from the DBMS and using its own TCP/IP-based network communications protocol for fast data transfer.

With the direct connection, the ArcSDE server and client functionality are executed on the desktop computer as the client application. Since no ArcSDE application server process is utilized, this is referred to as a two-tiered architecture (i.e., just the client application and the DBMS). When a client application is connected to the DBMS through a direct connection, the DBMS network software and the ArcSDE gateway services are dynamically loaded into the application. The application connects to the DBMS by connecting to the local Microsoft SQL Server or Oracle client. All data transfer is over the DBMS network software (Net8 for Oracle).

For more information on ArcSDE connection configuration options, see Chapter 4 of *Understanding ArcSDE* for ArcSDE 8.1.

14. Can I edit spatial data using the direct connection?

Yes, a user will be able to edit spatial data using a read–write direct connection. As described earlier, at 8.1 all of ESRI's client applications will have the capability for a read-only direct connection. In addition, ArcSDE provides ArcEditor, ArcInfo, and custom applications developed with ArcObjects with the capability of having a read–write direct connection.

15. Are there differences in client functionality or database schema between using a direct connection or the ArcSDE application server?

No, there are no differences in functionality or schema between these configuration options.

16. If I decide to use the direct connection to Oracle8*i* Spatial from ESRI clients, do I need all the ArcSDE metadata tables in my Oracle database?

Yes. The direct connection is built with ArcSDE technology. Therefore, the same ArcSDE user and metadata requirements exist.

17. What are the advantages of a direct connection versus using an ArcSDE application server?

The answer to this question depends largely on the circumstances of each customer's configuration. Internal ESRI testing has shown that both can work well, depending on the situation. In general, a direct connection can be simpler to administer and provide greater flexibility, while using an application server can reduce network traffic and provide faster performance. For more information, see Chapter 4 of *Understanding ArcSDE* for ArcSDE 8.1.

18. Does a customer need ArcSDE 8.1 for DB2 Universal Database or ArcSDE 8.1 for Informix with IBM's DB2 Spatial Extender or Informix's Spatial DataBlade?

Yes, if you want to use any of ESRI's client products (ArcGIS 8.1 Desktop products, ArcIMS 3, ArcView GIS 3.2, MapObjects 2.x, or ArcSDE CAD Client) with IBM DB2 or Informix, you must also use ArcSDE 8.1 as the gateway to those databases. Without ArcSDE, customers are limited to using a special ArcExplorer Java browser that connects to IBM DB2 and Informix using Java Database Connectivity (JDBC), or they can type in SQL commands to use the Spatial Extender and Spatial DataBlade.

19. How are the IBM DB2 Spatial Extender, the Informix Spatial DataBlade, and Oracle Spatial different from ArcSDE 8.1?

Each of these products provides spatial-type support, a spatial index mechanism, and a set of spatial operators for search and access. The combination of these three features allows applications to work with the spatial data directly through an IBM DB2, and Informix, or Oracle standard database interfaces.

However, from the perspective of our GIS-focused customers and business partners, each of these products is only a foundation for GIS data management, not a comprehensive solution. ArcSDE adds value to each of these products by enabling the IBM DB2 Spatial Extender, the

Informix Spatial DataBlade, and Oracle8*i* Spatial to be used for GIS data management for ESRI client applications and by adding performance and additional services. Perhaps as important as what ArcSDE adds to these products is that ArcSDE can help ensure the value of a customer's investment in spatial data by providing *opportunities* for alternate implementations.

20. Can you expand on what additional services ArcSDE adds to the IBM DB2 Spatial Extender, the Informix Spatial DataBlade, and Oracle8*i* Spatial and how ArcSDE provides opportunities for alternate implementations?

As explained above, ArcSDE is the gateway to the DBMS for ESRI's client applications. Without ArcSDE, customer sites are limited in what they can do with their spatial databases.

ArcSDE adds the following key features to the IBM DB2 Spatial Extender, Informix Spatial DataBlade, and Oracle8*i* Spatial.

- Database portability
- Schema portability
- Data integrity
- Additional data types
- Reduced cost of database development with tools and data sets
- Reduced cost of custom application development with APIs and development tools
- Options for reduced cost of deployment of DBMS-based GIS data management
- Support for direct editing of spatial data in the DBMS including multiple user editing with long transactions and advanced rule-based editing with ArcGIS 8

For more information, see Chapter 1 of the 8.1 edition of *Understanding ArcSDE* or look for the new ArcSDE white paper at www.esri.com/software/arcinfo/arcsde/index.html.