CHAPTER 10

Connectivity and Networking

One of the DBA's key tasks is to establish and maintain connectivity between the database on the server and the user community. In the traditional client/server model, users connect to the databases on a separate server by using a client. The client/server model is still used in many places to run business functions. Web-based connection models are much more common today as a means of connecting to databases.

Oracle9i provides several methods of connecting database servers to end users. For small sets of users, you can use the Oracle tnsnames.ora file, which is a local file with the server and the database information. Using this file, users can connect to the database.

NOTE Oracle also provides the "Names" method for organizations with larger client installations. Oracle clearly indicates in its documentation, however, that it will discard the Oracle Names method; therefore, I won't dwell too much on this method of making connections to the Oracle database.

The most sophisticated connection method provided by Oracle is the directory naming method. You can also use Oracle Internet Directory (OID) for security management and other purposes besides facilitating database connectivity. It's easy to set up OID, and this chapter takes you through all the necessary steps to install and configure OID. You'll also see how you can migrate from a tnsnames.ora naming method to OID using both a GUI-based method and a manual method.

The chapter also provides you a quick introduction to Java Database Connectivity (JDBC). You'll learn how to connect to an Oracle database from within a Java program, and you'll step through a small example that illustrates the basic concepts of Oracle JDBC.

The final section of this chapter deals with testing and troubleshooting Oracle Net Services. Most of the problems you'll encounter when you're troubleshooting networking issues are very easy to fix, and this chapter shows you how to take care of typical connectivity problems.
Chapter 10

Oracle Networking and Database Connectivity

After you create the database and the various database objects and load the data, the next big step is to establish connectivity between the database server and the users who will be using it. Oracle Net Services is the set of services that enables connectivity among the database servers, client applications, and the users. You’ll use Oracle Net Services to connect to and manage the interaction between the client and the server. Of course, to maintain connectivity, Oracle Net Services components have to “live” on both the client and the server. Typically, Oracle Net Services uses the TCP/IP network protocol to establish network connectivity between clients and the database server.

Oracle Net Services is configured with several important features to make life easier for DBAs. Important among these features are the following:

- **Location Transparency**: Clients need not know the network location or any other privileged information about database services, because you can maintain the information in a centralized repository. Users can be given only the database name, and the connection could be entirely transparent to them.

- **Centralized Configuration**: For large installations, a centralized means of establishing and maintaining connections makes a lot of sense. The LDAP-compliant directory server supported by Oracle provides a very efficient centralized repository for meeting all your networking needs. Network, authentication, and other security information is saved in a central place, and numerous users then access this information. Maintenance is extremely easy, because regardless of the number of clients, you only have to modify the centralized information.

- **Scalability**: Oracle offers a specialized architecture to enhance scalability called the *shared server architecture*. The shared server architecture enables several users to share the same connection process through the use of a dispatcher process. Therefore, a small number of server connections can enable a large number of end users to use the system, thus increasing the scalability of the system. In addition, Oracle provides the Connection Manager feature, which provides connection multiplexing whereby multiple connections are taken care of simultaneously.

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**Shared Server vs. Dedicated Server Architecture**

You can set up a connection architecture where the Oracle server starts a separate server process for each client connection or you can enable several clients to share a single server process. The separate server process uses dedicated connections between each client and the Oracle server, and it is therefore named the *dedicated server architecture*. The *shared server architecture* is the name given to connections where several user processes use same Oracle server connection to perform their work.