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# Oracle Network Products for Windows NT/95

Version 2.3.2.1.0 Production

Release Notes April 1996

## Windows NT MIPS Support

SQL\*Net version 2.3 is not currently available for use on Windows NT machines using a MIPS processor.

## SQL\*Net Easy Configuration or Oracle Network Manager for Windows

Oracle only supports configuration files created by using one of these two products: the SQL\*Net Easy Configuration utility (for simple database connections) or Oracle Network Manager for Windows (for advanced SQL\*Net features, such as Secure Network Services).

Oracle strongly recommends that every machine in the workgroup network be configured with one, and only one, of the configuration utilities: SQL\*Net Easy Configuration, or Oracle Network Manager for Windows.

SQL\*Net Easy Configuration and Oracle Network Manager for Windows are mutually exclusive on any one machine.

SQL\*Net Easy Configuration allows you to add up to 15 new database aliases.

## SQL\*Net Easy Configuration and Configuration Files

Do not modify files in the following directories:

- *ORACLE\_HOME*\NETWORK\ADMIN
- *ORACLE\_HOME*\NETWORK\CFG

## SQL\*Net Easy Configuration and Client–Server Configuration

SQL\*Net Easy Configuration can be used to configure a client machine to communicate with a server machine. If the server machine was configured with Oracle Network Manager for Windows, and you want to use SQL\*Net Easy Configuration to add the server machine's database alias to the client machine:

- use the Add Database Alias feature
- do not use the Modify Database Alias feature to modify the example aliases provided with SQL\*Net Easy Configuration.

## Back Up TNSNAMES.ORA

If you have a pre-existing TNSNAMES.ORA file, make a copy of it before installation.

Make sure you know the network address of your server machine.

## Back Up LISTENER.ORA (Windows NT only)

If your Windows NT server has a pre-existing LISTENER.ORA file, make a copy of it before installation.

Each time you run SQL\*Net server installation, pre-existing versions of the LISTENER.ORA and SQLNET.ORA files are incrementally backed up to LISTENER.001, LISTENER.002, SQLNET.001, SQLNET.002, etc. This prevents these files from being overwritten.

## Starting the Listener

Refer to Chapter 4 of the *Oracle Network Products for Windows NT/95 Installation and User's Guide* for instructions on starting the listener.

## Stopping the Listener (Windows NT only)

If the `PASSWORD_listener_name` parameter is specified in the `LISTENER.ORA` file, follow these steps to stop the Listener process:

1. Invoke the `LSNRCTL` utility program.
2. Type `"set password xxxx"` at the `LSNRCTL` prompt, where `xxxx` is the password specified in the `LISTENER.ORA` file.
3. Stop the Listener.

## Before Installing the SPX/IPX Protocol Adapter (Windows NT only)

Microsoft NWLINK must be installed on the machine before you install the Oracle SPX/IPX Protocol Adapter.

## SQL\*Net for Windows NT Server, Version 2.3.2.1.0 Production

A SQL\*Net V2 TNS Listener listening on an SPX address takes more time to start than the other two protocols (TCP/IP and Named Pipes).

A SQL\*Net V2 TNS Listener listening on an SPX address may fail to restart immediately after you stop it. If so, wait for a minute before restarting the TNS Listener. If you restart without waiting, the following error message may appear: "TNS-12542: TNS: Address already in use".

To start or stop the TNS Listener, use the LSNRCTL utility or the following Windows NT command:

```
net start OracleTNSListener<listenername>
net stop OracleTNSListener<listenername>
```

## Oracle SPX 2.3 and Windows NT 3.1/3.5

If you use Windows NT Version 3.1, you can only make connections to NetWare 3.x servers. If you use Windows NT Version 3.5, you can make connections to NetWare 3.x and 4.x servers.

## OS/2 Connectivity for the Named Pipes Protocol

A Windows NT client cannot connect to an OS/2 Server using the Named Pipes protocol.

An OS/2 client cannot connect to a Windows NT Server using the Named Pipes protocol.

## OS/2 Connectivity for the SPX/IPX Protocol

If your Windows NT Client cannot connect to an OS/2 Server using the SPX/IPX protocol on a Frame type (for example, Ethernet II), change the Frame type of the Windows NT Client to a different one (for example, Ethernet 802.2), and try again.

If your Windows NT Server cannot connect to an OS/2 Server and

- you are using a single Frame type for both
  - Windows NT Client – Windows NT Server communication, and
  - Windows NT Server – OS/2 Server communication

then, specify two Frame types in the Windows NT Server:

- one Frame type for Windows NT Client – Windows NT Server communication (for example, Ethernet II), and
- a different Frame type for Windows NT Server – OS/2 Server communication (for example, Ethernet 802.2)

## No Prespawnd Dedicated Server Processes Supported by TNS Listener

This release does not support Prespawnd Dedicated Server Processes by the TNS Listener. When you use the Network Manager to specify parameters in each SID\_DESC of the LISTENER.ORA file, do not include the following parameters:

- PRESPAWN\_MAX
- PROTOCOL
- POOL\_SIZE
- TIMEOUT

## Tasking Problems When Running SQL\*Net 2.3.2.1.0 on Windows NT

The performance of any 16-bit Windows application running in Windows on Windows NT (WOW) is degraded if the Tasking (in Control Panel/System/Tasking) is set to the default (Best Foreground Application Response Time). To remedy this situation, choose one of the other two tasking options.

## Oracle Names Server for Windows NT, Version 2.0.1.1.0 Production

The Dynamic Discovery Option (DDO) is a new feature of this Oracle Names release.

A SQL\*NET client no longer requires the TNSNAMES.ORA in order to locate a service. If the TNSNAMES.ORA is created, the client first uses it to resolve the service name before resolving it through the DDO.

A SQL\*NET server requires the following entries in the LISTENER.ORA file for a listener to register itself as a service to a well known name server.

```
(SID_DESC = (SID=...)
              (GLOBAL_DBNAME=service)
            )
USE_PLUG_AND_PLAY=ON
```

where the *service* is the service name to be registered with the name server.

With the DDO, the customer needs to configure the Names Server with one of the well known names. The name to use is based on the type of connection being used:

<i>The well known host names for TCP connections are:</i>	<i>The well known service name for an SPX connection is:</i>	<i>The well known computer names for Named Pipes connections are:</i>
oramesrvr0	oramesrvr	oramesrvr0
oramesrvr1		oramesrvr1
oramesrvr2		oramesrvr2
oramesrvr3		oramesrvr3
oramesrvr4		oramesrvr4

The DDO is automatically disabled in the SQLNET.ORA file in the ORACLE\_HOME\NETWORK\ADMIN directory. To use the DDO, enable the NAMES.DIRECTORY\_PATH parameter in this file. Refer to the *Oracle Names Administrator's Guide* for instructions.

Refer to the *Oracle Names Administrator's Guide* to learn more about planning, configuring, running and managing Oracle Names.

## Security for the Named Pipes Protocol

If both the Names Server and the TNS Listener are installed on the same machine, follow the steps below:

1. Go to the Windows NT Control Panel.
2. Double-click on the Services icon.  
The **Services** dialog box appears.
3. Scroll to Oracle Names Service and double-click.  
The **Service** dialog box appears.
4. Select the "This Account" radio button in the Log On As box.
5. Click on the . . . button next to the "This Account" radio button.

The **Add User** dialog box appears.

6. Select your logon id (user id).
7. Press the Add button.
8. In the Log On As box, type your logon id password in the Password field.
9. Retype the same logon id password in the Confirm Password field.
10. Press OK.

The **Service** dialog box re-appears.

11. Choose Close to return to the Control Panel.
12. Start the Name Server using the following command in the command line:

```
NAMESCTL START
```

## Oracle Intelligent Agent Installation for Windows NT

Oracle Intelligent Agent installation is not described in the *Oracle Network Products User's Guide for Windows NT/95*. Refer to Chapter 2 of *Oracle7 Server Getting Started for Windows NT* for instructions on installing the Oracle Intelligent Agent. When you access the Software Asset Manager dialog box during the installation process, the Oracle Intelligent Agent is available for installation from either of the following options:

- Networking Products
- Oracle7 Server

## Functionality Differences Between the Oracle Intelligent Agents on UNIX and Windows NT

The Oracle Enterprise Manager documentation often describes Oracle Intelligent Agent functionality in a UNIX environment. This table describes differences in functionality for the Oracle Intelligent Agent in a Windows NT environment.

<b><i>Event/Job</i></b>	<b><i>Description</i></b>
event /oracle/host/perf/cpuload	On Windows NT, the reported CPU load (cpuload) is the number of threads and <i>not</i> the number of processes. Only a thread can be scheduled on Windows NT, <i>not</i> a process. For processes with only a single thread, the effect is as if it were the process being scheduled.
event /oracle/host/perf/cpuutil	The CPU utilization of the instrumentation process is included in the reported % value. Thus, if the interval of measurement is short, the reported value is very high. On multiprocessor systems, only the average value is reported, even though individual CPU utilization is measured.
event /oracle/host/perf/paging	Under some circumstances, reported paging rates (pages/sec) may be lower than the true values.
event /oracle/host/space/diskfull	The reported measure is % free and is not an absolute number ( <i>not</i> bytes or KB or MB etc). Each reported volume is a logical drive and not a physical drive. Only local volumes are monitored.
event /oracle/host/space/swapfull	The reported measure is % free and is not an absolute number ( <i>not</i> bytes or KB or MB etc). If the page file does not have its own exclusive partition, the %free measure reported can be meaningless – the partition can be full even though the page file is not.
job /oracle/host/general/brdcast	Broadcasting of messages to all logged on users on the managed Windows NT node is not supported.
job /oracle/host/general/osexec	Path names can be either in "/" format or "\\\" format. However, this TCL script can erroneously convert "/" to "\\\" when one is not desired, thus causing the command to fail.



<b><i>Event/Job</i></b>	<b><i>Description</i></b>
	"dir /w d:/orant" ==> "dir \\w d:\\orant" : dir does not understand \w
job /oracle/rdbms/general/shutdown	Shutdown can fail under some circumstances. Server Manager (shutdown job) waits indefinitely trying to do a "normal shutdown" since the Oracle Intelligent Agent already has a database connection open to it. Under this situation, it is necessary to shut down the Oracle Intelligent Agent in order to shut down the database.

### Additional Issues

<b><i>Issues</i></b>	<b><i>Description</i></b>
SQL*DBA	SQL*DBA is no longer supported on Windows NT. Use Server Manager instead.
Backing Up to Tape	Tablespace backup to tape is not supported for this Oracle Intelligent Agent release.
SNMP	SNMP capabilities are not enabled for this Oracle Intelligent Agent release.
Documentation Issues	Check the Oracle Enterprise Manager console documentation for any other limitations for this Oracle Intelligent Agent release on Windows NT.

# Oracle Network Products User's Guide for Windows NT/95

**Release 2.3**

Part No. A44128-1

**ORACLE<sup>®</sup>**

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The Relational Database Management System

Oracle Network Products User's Guide for Windows NT/95, Release 2.3

Part No. A44128-1

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# Preface

**T**his manual provides operating system–specific information on how to install, configure, and use the Oracle Protocol Adapters, SQL\*Net, SQL\*Net Easy Configuration, Oracle Names, and Oracle Network Manager for Windows. This preface provides detailed information about:

- Audience
- How this manual is organized
- Conventions used in this manual
- Reader comments



**Attention:** To verify the version of each product described in this manual, refer to Chapter 1 or the *Release Notes* included in your Oracle product kit.

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## Audience

This manual is for both end-users and network administrators who install, configure, and use Oracle network products. Use this manual in conjunction with a machine running Windows NT or Windows 95 (server or client workstation). This manual assumes the following:

- you have installed and tested your network
- you are familiar with your operating system (commands for deleting and copying files; concepts of search path, configuration files, and directory structure) and concepts such as server and client
- you know how to use a text editor to make changes to an ASCII text file

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## How this Manual is Organized

This manual consists of the following chapters and appendices.

### **Chapter 1 Introducing Oracle Network Products**

Describes each supported Oracle Protocol Adapter, SQL\*Net, Oracle Network Manager for Windows, and Oracle Names.

### **Chapter 2 Installing Oracle Network Products**

Provides installation instructions (from CD-ROM) for Oracle network products.

### **Chapter 3 Using SQL\*Net Easy Configuration**

Provides instructions on using SQL\*Net Easy Configuration to automatically configure SQL\*Net for users with simple configuration needs.

### **Chapter 4 Using Oracle Network Products**

Explains how to log in and connect to a database.

### **Appendix A Oracle Installer Error Messages**

Lists messages that can arise during installation.

### **Appendix B Registry for Windows NT and Windows 95**

Explains how the network administrator gains access to Oracle-related system settings.

### **Appendix C Sample Configuration Files**

Provides examples of TNSNAMES.ORA, SQLNET.ORA, and LISTENER.ORA.

### **Appendix D Verifying Installation of Oracle Network Products**

Shows the directory structure for installed products and explains how to verify the proper installation of Oracle Network Products.

### **Appendix E Configuring Oracle Network Products**

Provides information enabling the network administrator using Network Manager for Windows to configure the client to access an Oracle7 Server.

## **How to Use this Manual**

The network product documents listed below use an OS Doc icon in their margins to refer users to this manual (which is the operating system-specific manual) for installation and configuration of Oracle network products.

Use this manual in conjunction with the Oracle network products documents listed below. This manual also describes the protocol terms and concepts and protocol-specific keywords used in the connect descriptors.

- *Understanding SQL\*Net*
- *Oracle Network Manager Administrator's Guide*
- *Secure Network Services Administrator's Guide*
- *Oracle Names Administrator's Guide*
- *Oracle Network Products Troubleshooting Guide*
- *Oracle Network Products Messages Manual*
- *Oracle SNMP Support Reference Guide*
- *Oracle MultiProtocol Interchange Administrator's Guide*

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## **Conventions Used in this Manual**

The Oracle Installer creates the directory structure for all Oracle products. A main directory, the ORACLE\_HOME directory, holds the Oracle subdirectories and files.

The default ORACLE\_HOME directory for Windows NT is ORANT.

The default ORACLE\_HOME directory for Windows 95 is ORAWIN95.

This manual assumes that all directory names are the default names given during the installation of Oracle network products. If you set up your system using different directory names, substitute them for the ones in this manual. Appendix D lists the directory structure for installed Oracle network products.

## Special Terms

This manual uses the following special terms:

Client	A system that runs an Oracle-supported application and connects to the shared database(s) on an Oracle7 Server.
Server, or Oracle7 Server	A host system that runs a multiuser Oracle7 Relational Database Management System (RDBMS) and maintains at least one database that can be shared by remote clients. The term "Oracle7 Server" refers to the RDBMS that is using SQL*Net and is capable of serving any Oracle client.
Oracle7 database	The software used to create and maintain the database system, as well as the actual data stored in the database.
Oracle7 RDBMS	The Oracle RDBMS. Oracle7 Server and Oracle7 Workgroup Server are examples of an Oracle RDBMS.
TNS	Transparent Network Substrate (TNS) is the Oracle networking technology that provides a single application interface to all industry-standard networking protocols.
TNS-based application	A TNS-based application uses the common functions of the TNS interface to transmit data across one or more networks. SQL*Net is a TNS-based application.
Service name	A short, convenient name mapped to a network address contained in a TNS connect descriptor. Users need only know the appropriate service name to make a TNS connection.
Connect descriptor	A specially formatted description of the destination for a network connection. Connect descriptors are constructed using a set of keywords and values mapped to service names. For example, an Oracle Tool would use a service name representing a connect descriptor to initiate a TNS connection with an Oracle7 Server. Each connect descriptor is

	assigned a service name in the network definition and stored in the TNSNAMES.ORA network configuration file, in an Oracle Names database, or in a native naming service.
Network listener or listener	An executable program that enables an Oracle7 server to accept connections from client machines over SQL*Net.
Oracle Names	Transparent naming software for central storage of network names and addresses in the Names servers database. Oracle Names enables network components to connect easily without regard to specific physical locations or configurations on the network. A complete description of Oracle Names and its configuration file appears in the <i>Oracle Names Administrator's Guide</i> .
Oracle Network Manager for Windows	A tool that provides on-screen forms the network administrator fills in to define network objects. The product creates the necessary configuration files for use by server and client machines. A complete description of Oracle Network Manager for Windows appears in the <i>Oracle Network Manager Administrator's Guide</i> .
TNS community	A group of TNS-based applications that communicate with one another using a single network protocol. TNS communities are commonly named according to the protocol in use. For example, "TCP/IP community" refers to a discrete network running the TCP/IP protocol.
TNS connection	A TNS connection is an application-level connection between two TNS-based applications.
Oracle Protocol Adapter	The software component of the TNS architecture that translates TNS function calls into calls of the underlying network protocol.
Oracle Tool	Any Oracle application tool, such as SQL*Plus, or an Oracle end-user tool, such as Oracle Forms, or third-party software that interfaces with an Oracle7 Server.
SQL*Net	Oracle client/server communication software that offers transparent operation to Oracle Tools or databases over various network protocols and operating systems.



Oracle MultiProtocol Interchange	Software that enables clients on separate networks using different protocols to communicate by translating from one protocol to another. Complete descriptions for this product and its configuration files appear in the <i>Oracle MultiProtocol Interchange Administrator's Guide</i> .
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## Notational Conventions

This manual uses the following notational conventions:

<code>Monospace text</code>	Type text exactly as shown. Text typed for a command statement is not case sensitive unless noted otherwise.
<code>[ ]</code>	Brackets enclose optional items or indicate a function key. Do not enter the brackets.
Punctuation	Punctuation other than brackets and vertical bars must be entered in commands exactly as shown.
UPPERCASE	Uppercase characters within the text represent command names, SQL reserved words and keywords, and example filenames.
<code>lowercase mono</code>	Lowercase characters within command lines represent variables. Substitute an appropriate value for the variable. In examples, lowercase characters represent sample values for the variables.
<i>lowercase italics</i>	Lowercase italics in the text represent variables. Substitute an appropriate value for the variable.
<code>C:\&gt;</code>	Represents the DOS prompt of the hard disk drive you are using. Your prompt designator can differ.
<code>\DIRECTORY</code>	A backslash before a directory name signals that the directory is a subdirectory.

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## Reader Comments

We value and appreciate your comments as a user of Oracle products and a reader of our manuals. At the back of this manual is a Reader's Comment Form. We encourage you to use this form to tell us what you like and dislike about this (or other) Oracle manual(s). If the form is missing, you can contact us at the following address:

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# Introducing Oracle Network Products

**T**his chapter describes Oracle network products, protocol terms, and SQL\*Net concepts. Specifically, this chapter covers the following topics:

- Oracle protocol adapters
- client/server architecture overview
- Open Systems Interconnect model
- supported Oracle network product versions and vendors
- overview of each supported Oracle protocol adapter
- additional Oracle network products



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## Oracle Protocol Adapters

An Oracle Protocol Adapter translates (or adapts) function calls of specific network protocols into equivalent function calls of Oracle's Transparent Network Substrate (TNS). Conversely, an Oracle protocol adapter translates (or adapts) TNS function calls into function calls for the underlying network protocol.

An Oracle Protocol Adapter is necessary for any TNS-based application that communicates across a network through the supported protocol. SQL\*Net and the Oracle MultiProtocol Interchange are examples of TNS-based applications.

TNS is the name of Oracle's networking technology, which creates a single application interface to industry-standard networking protocols.



**Additional Information:** For additional information about TNS architecture, the network configuration of Oracle protocol adapters and SQL\*Net, and how to upgrade version 1 of SQL\*Net to version 2, see *Understanding SQL\*Net*.

The Oracle Protocol Adapters support the following protocols running under Windows NT/Windows 95:

- TCP/IP
- SPX/IPX
- Named Pipes Client
- Named Pipes Server for Windows NT

For a detailed technical discussion of these protocols, see the third-party network documentation that came with your protocol software.

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## Client/Server Architecture Overview

Client/server architecture is a way of separating a database application into two parts. The two parts can run on separate computers and communicate with each other over a network, as described below.

### Client/User

The user requests database information from the server by supplying input to an Oracle tool running on the client machine. The Oracle tool accepts this input from the user through the keyboard and mouse, and gives it to SQL\*Net to be transported across the network to the server.

SQL\*Net uses an Oracle Protocol Adapter to establish and maintain connections to Oracle7 servers on the network. The Oracle Protocol

Adapter translates the SQL\*Net (TNS) functions into equivalent protocol-specific functions in the underlying network.

## **Server**

The server portion runs the Oracle7 database software and a SQL\*Net network listener program. The SQL\*Net network listener, through an Oracle Protocol Adapter, accepts connections from client applications anywhere on the network. (Clients must use the same protocol or go through a MultiProtocol Interchange.) SQL\*Net must be installed on both the client and server for user input to be transferred from the client machine to the server machine.

SQL\*Net on the server then delivers that user's request to the Oracle7 Server database. The database performs the function requested by the user on the client machine. Finally, SQL\*Net transfers the results of the database functions to the client machine.

## **Database Sharing and Local Data Usage**

Client/server architecture makes it easy for one database to be shared by remote workstations. It allows the server to perform various database management tasks, while the clients manipulate data locally without taxing server and network resources.

## **Distributed Processing**

In a typical network configuration, the client and server portions of the database management system reside on different machines to enable the division of labor between client and server. The server must have sufficient memory, disk storage, and processing power to execute and administer the database. Clients need only enough memory to execute an application or tool that accesses the database server over a network. This separation of work between different computers is called *distributed processing*.

## **Distributed Databases**

A *distributed database* is a network of databases stored on multiple computers. This database network appears to the user as a single logical database. Each physical database is controlled by its own local database management system, and is connected to the remote physical databases through SQL\*Net.

Distributed database servers are connected by a database link, which acts as a "path" from one database to another. A server uses the database link queries and modifies information on other servers as needed, thereby acting as a client to the other servers.

Users can access the multiple servers of a distributed database simultaneously. For example, a user can easily join tables from multiple servers into a single view. The server's database administrator (DBA) can set up database links so that the location of the data does not have to be specified by the user. This is called *location transparency*.

Each database participating in a distributed database system is said to be “site-autonomous.” The databases are administered separately and independently. Using SQL\*Net, a network administrator can perform tasks on Oracle servers both locally and remotely (across a network).

---

## Open Systems Interconnect model

Because of the diversity of network architectures, the International Standards Organization (ISO) established a model describing the transmission of data across networks. The Open Systems Interconnect (OSI) model outlines a seven-layer software structure for data communication. Layer 1, the lowest layer, supports physical transmissions. Layer 7, the highest layer, supports the interface to users or applications. Each OSI layer provides a service for the layer immediately above it.

<b>The Lower OSI Layers</b>	The first three layers of the OSI model support the hardware and electronic transmission involved in network communications.	
	Layer 1 <b>Physical</b>	Supports the actual physical medium used and the electronic signals transmitted (wire or cable). Software found here supports Ethernet, Token Ring, or other network media.
	Layer 2 <b>Data Link</b>	Operating-system driver routines control the hardware, sending or receiving a single message or byte string.
	Layer 3 <b>Network</b>	The routing layer, where communications software decides which network pathways to use for message traffic.

<b>The Higher OSI Layers</b>	The higher OSI layers support the translation, security, and sending of information from one machine on a network to another.	
	Layer 4 <b>Transport</b>	Responsible for reliable transmission of data (including making sure messages are appropriately buffered and causing retransmissions for garbled messages). This layer packages user messages for transmission by the lower layers.
	Layer 5 <b>Session</b>	Responsible for creating, closing, and coordinating process-to-process connections. This layer permits the user to invoke file transfers and “virtual terminal” services.

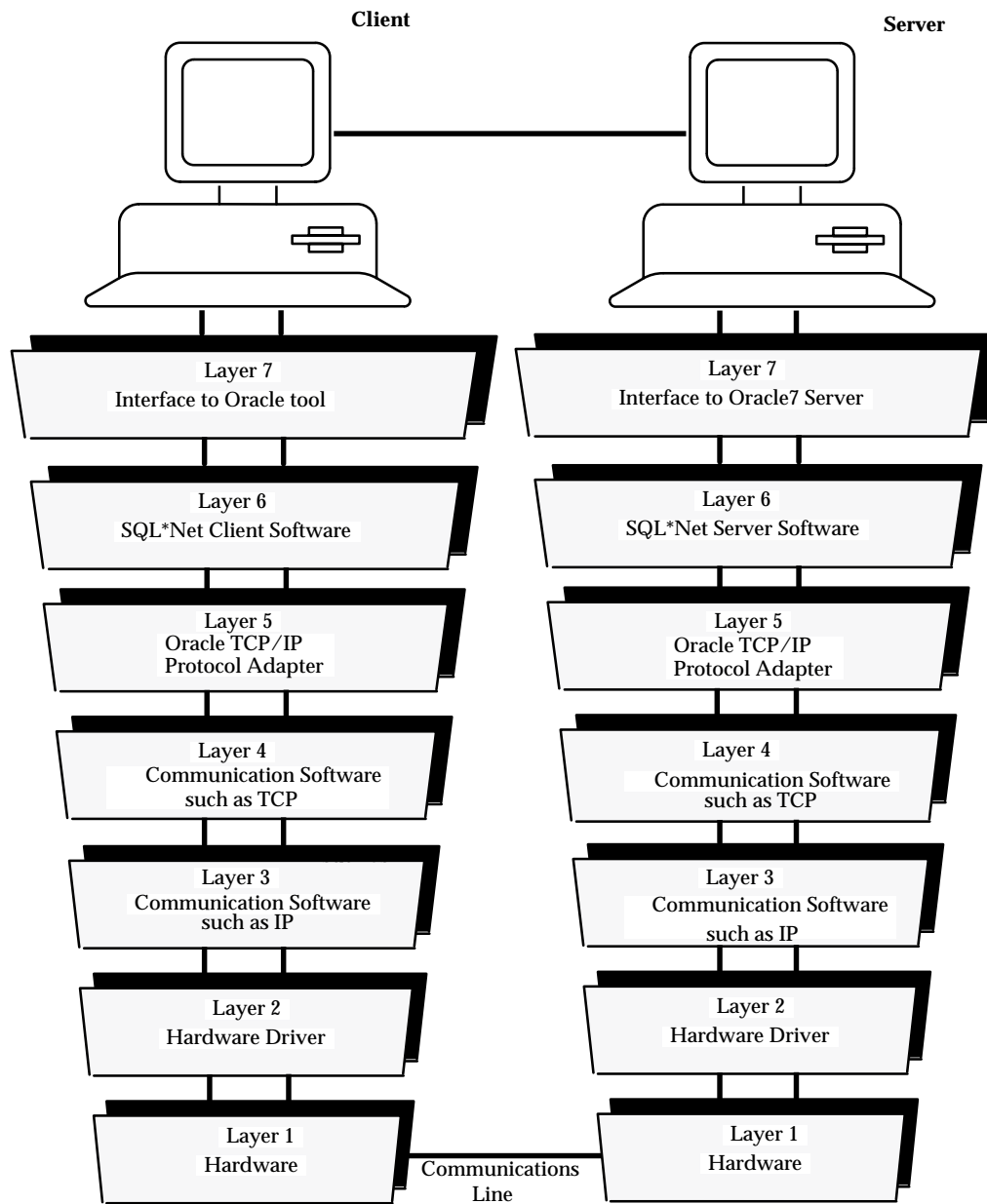
<b>Layer 6 Presentation</b>	Processes that rely directly on the session layer for network services.
<b>Layer 7 Application</b>	The interface between applications (such as Oracle tools on a client workstation or Oracle7 Servers on a database server) and the network communications software.

## **Oracle Protocol Adapters and the OSI Model**

In a client/server session, the Oracle Protocol Adapter and SQL\*Net on the client side take the SQL requests from the application and package them for transmission. Once the network package is received by the server machine, the Oracle Protocol Adapter and SQL\*Net on the server side assemble the SQL statements from the network package, and then pass them to the Oracle7 Server database. When the Oracle7 Server replies, the data is sent back to the client machine through the same mechanism.

In terms of the OSI model, Oracle Protocol Adapters reside at the fifth layer (session), and SQL\*Net software resides at the sixth layer (presentation). The Oracle Protocol Adapter provides an interface to the fourth layer (transport) of the network communication software. The lower layers are invisible to SQL\*Net and the Oracle Protocol Adapters.

This network hardware and software independence makes it possible to run the software on many networks and establish inter-network communications. The following figure shows where the Oracle protocol adapter software of both the client and the server fit into the seven-layer OSI model (layer 5).



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# Supported Oracle Network Product Versions and Vendors

This table lists the Oracle network products, releases, and supported vendors covered in this Guide.

<i>Oracle Network Products for Windows NT/Windows 95</i>	<i>Release</i>	<i>Supported Vendors</i>
SQL*Net*	2.3	Oracle Corporation
Oracle TCP/IP Protocol Adapter	2.3	Microsoft TCP/IP
Oracle SPX Protocol Adapter	2.3	Microsoft NW Link
Oracle Named Pipes Protocol Adapter (for Windows 95 client only, for Windows NT client and server)	2.3	Microsoft NETBEUI
Oracle Network Manager for Windows	3.1	Oracle Corporation
Oracle Names	2.0	Oracle Corporation
* The Bequeath Protocol Adapter is automatically installed with SQL*Net Client on Windows NT. Refer to Chapter 4 for a description of Bequeath Protocol Adapter features.		

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## Overview of Each Supported Oracle Protocol Adapter

### TCP/IP

TCP/IP is a combination of network protocols:

- a transport-layer protocol, the Transmission Control Protocol (TCP)
- a network-layer protocol, the Internet Protocol (IP)

These protocols together facilitate transferring data across a network.

### TCP Protocol

TCP provides services at Layer 4, Transport, a connection-oriented protocol for establishing reliable, sequenced data transfer.

### IP Protocol

IP provides network-layer services at Layer 3, Network, the routing layer close to the hardware that carries the communication.

**Note:** For more information on TCP and IP, see your operating system documentation.

**Oracle TCP/IP Protocol Adapter** The Oracle TCP/IP Protocol Adapter contains a set of dynamic link libraries (DLLs) that enable client/server conversation over a network using TCP/IP and SQL\*Net. This combination of Oracle products enables an Oracle application on a client to communicate with remote Oracle databases through TCP/IP (if the Oracle database is running on a host system that supports network communication using TCP/IP).

The Oracle TCP/IP Protocol Adapter provides process-to-process connection services at Layer 5, Session.

## **SPX/IPX**

SPX/IPX is a combination of network protocols:

- a transport-layer protocol, the Sequenced Packet Exchange (SPX)
- a network-layer protocol, the Internetwork Packet Exchange (IPX)

SPX/IPX carries data packets between clients and their servers.

SPX and IPX are specifically designed for personal computer (PC) local area network (LAN) environments. They are high-performance communications protocols suitable for memory-constrained PC workstations. SPX/IPX supports all major PC operating systems.

## **SPX Protocol**

SPX is a high-performance communications protocol that provides transport-layer services under the OSI model. SPX is a connection-oriented protocol for establishing a reliable, peer-to-peer connection between the source and destination of a network request before sending any data packets. SPX guarantees delivery, sequencing of packets, and correction of errors encountered.

SPX provides services at Layer 4, Transport.

## **IPX Protocol**

IPX is a connectionless protocol that provides network-layer services in the OSI model. Connectionless protocols do not establish connections between the source and destination of network requests. Data packets are addressed and sent, but the sender has no guarantee that data is successfully delivered or correctly sequenced.

IPX provides network-layer services at Layer 3, Network, the routing layer close to the hardware that carries the communication.

**Note:** For more information on the SPX and IPX protocols, see the Novell manual that came with your SPX/IPX software.

## **Oracle SPX Protocol Adapter**

The Oracle SPX Protocol Adapter contains a dynamic link library (DLL) that enables client/server conversation over a network using SPX/IPX and SQL\*Net. This combination of Oracle products enables an Oracle application on a client to communicate with remote Oracle databases through SPX/IPX (if the Oracle7 database is running on a host system that supports network communication using SPX/IPX).

The Oracle SPX Protocol Adapter provides process-to-process connection services at Layer 5, Session.

## **Named Pipes**

Named Pipes is a high-level interface providing interprocess communications between clients and servers (distributed applications). One process (the server side of the application) creates the pipe, and the other process (the client side) opens it by name. What one side writes, the other can read, and vice versa.

The Oracle Named Pipes Protocol Adapter allows an Oracle application on a client machine to communicate with remote Oracle databases through Named Pipes.

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## **Additional Oracle Network Products**

Additional Oracle network products include:

- SQL\*Net Easy Configuration
- Oracle Network Manager for Windows
- Oracle Names
- Secure Network Services

## **SQL\*Net Easy Configuration**

SQL\*Net Easy Configuration makes configuration quick and simple by automatically configuring Oracle network products. SQL\*Net Easy Configuration is documented in Chapter 3. Use SQL\*Net Easy Configuration if:

- your network administrator has chosen SQL\*Net Easy Configuration as your workgroup's network standard
- SQL\*Net configuration for your environment is not done by a central administrator (and you know your server name)



If your network standard is Oracle Network Manager for Windows, see Appendix E for more information.

**Suggestion:** See Appendix E if you are a network administrator and your setup requires special configuration.



**Attention:** Oracle only supports configuration files created by using SQL\*Net Easy Configuration (for simple database connections) or Oracle Network Manager for Windows (for advanced SQL\*Net features, such as Oracle Names and Secure Network Services).

**Caution:** Oracle strongly recommends that every machine in the workgroup network be configured with one, and only one, of the configuration utilities: SQL\*Net Easy Configuration or Oracle Network Manager for Windows.

**Caution:** SQL\*Net Easy Configuration and Oracle Network Manager for Windows are mutually exclusive on any one machine.

## Oracle Network Manager for Windows

Oracle Network Manager for Windows is a graphical user interface (GUI) tool that network administrators use to create and modify the configuration files required by Oracle networking products.

Chapter 2 of the *Oracle Network Products User's Guide for Windows* contains Oracle Network Manager for Windows installation instructions. Currently, no specific configuration tasks for this product are necessary for Windows NT or Windows 95. For information on using Oracle Network Manager for Windows, see the *Oracle Network Manager Administrator's Guide*.

**Caution:** You must use SQL\*Net Easy Configuration or Oracle Network Manager for Windows; you cannot use both together.

## Oracle Names

Oracle Names provides a central names service that spans across heterogeneous networks with different protocols to resolve names. Oracle Names simplifies network administration tasks, such as adding or relocating services. For more information about Oracle Names, see the *Oracle Names Administrator's Guide*.

Oracle Names version 2.0 supports the Dynamic Discovery Option, which lets you create configuration free networking while providing all the functionality of Oracle Names. The Dynamic Discovery Option can

be used as a network configuration tool instead of SQL\*Net Easy Configuration or Oracle Network Manager for Windows. Dynamic Discovery Option features include:

- Well-known Names Server addresses
- Dynamic service registration
- Replication of service definitions

These features allow:

- Services to register themselves with well-known Names Servers
- Clients to find well-known Names Servers without configuration
- Well-known Names Servers to automatically replicate their data to each other.

Refer to the *Oracle Names Administrator's Guide* for specific information.

## **Secure Network Services**

Secure Network Services is an optional product that enables data encryption and checksumming. For more information, see the *Secure Network Services Administrator's Guide*.



# Installing Oracle Network Products

**T**his chapter covers the following installation topics:

- installation overview for configuration tool users
- system requirements
- before you install
- CD-ROM quick start installation instructions
- CD-ROM detailed installation instructions
- installing and viewing Adobe Acrobat online documentation
- installing the Oracle Network Manager for Windows
- De-installing products

---

## Installation Overview for Configuration Tool Users

This section provides an installation overview for:

- SQL\*Net Easy Configuration users
- Oracle Network Manager for Windows users

 **Attention:** Oracle only supports configuration files created using SQL\*Net Easy Configuration (for simple database connections) or Oracle Network Manager for Windows (for advanced SQL\*Net features, such as Secure Network Services).

**Caution:** Oracle strongly recommends that every machine in the workgroup network be configured with only one configuration utility: SQL\*Net Easy Configuration or Oracle Network Manager for Windows.

**Caution:** SQL\*Net Easy Configuration and Oracle Network Manager for Windows are mutually exclusive on any one machine.

## Installation Overview for SQL\*Net Easy Configuration Users

1. Start the Oracle Installer for your operating system (Windows NT or Windows 95).
2. Install the appropriate Oracle network products (SQL\*Net Easy Configuration is automatically installed).
3. Exit the Oracle Installer.
4. Proceed to Chapter 3.

## Installation Overview for Oracle Network Manager Users

1. Start the Oracle Installer for your operating system (Windows NT or Windows 95).
2. Install the appropriate Oracle network products.
3. Exit the Oracle Installer.
4. Start the Oracle Installer for Windows 3.1.
5. Install the Oracle Network Manager for Windows.
6. Exit the Oracle Installer for Windows 3.1.
7. Proceed to Appendix E.

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# System Requirements

Ask your network administrator which option is the standard for your networking environment:

- SQL\*Net Easy Configuration
- Oracle Network Manager for Windows

## Hardware Requirements

The Oracle network product hardware requirements are:

- IBM, COMPAQ, or 100%-compatible PC based on an 80486 (or higher), Pentium, or MIPS processor
- network interface card supported by the network protocol vendor whose network software corresponds to the Oracle Protocol Adapter(s) you install
- connected CD-ROM drive
- minimum of 16 megabytes (MB) extended memory
- available hard disk space:

<i><b>Product</b></i>	<i><b>Disk Space</b></i>
Oracle SPX Protocol Adapter	38K
Oracle TCP/IP Protocol Adapter	41K
Oracle Named Pipes Protocol Adapter	28K
Oracle Names	2.3MB
SQL*Net Server (for Windows NT)	6.7K
SQL*Net Client	6.4MB
Adobe Acrobat Reader (for viewing online documentation)	2MB

**Software Requirements** The Oracle network product software requirements are:

- Windows NT 3.5 or later, or Windows 95
- third-party network software corresponding to the Oracle protocol adapter(s) you install.
- Oracle Network Manager for Windows, if you choose that option instead of SQL\*Net Easy Configuration.

**Note:** Oracle Network Manager for Windows lets you save your network definition on the local machine or to a database. If your network is configured for Oracle Names, the Oracle Names server stores service names and associated connect

descriptors in the Oracle7 database. Therefore, Oracle Network Manager for Windows does not generate the TNSNAMES.ORA file.

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## Before You Install

Before you install Oracle network products for Windows NT/Windows 95, perform the appropriate tasks listed below:

- ☐ Install your network hardware.
- ☐ Install Windows NT or Windows 95.
- ☐ Install your network software.
- ☐ Test your network hardware and software. (To test your network system connection, refer to your network system documentation.)
- ☐ Read the *Customer Support Information* booklet and return your registration card to the appropriate support center.
- ☐ Review the accompanying *Release Notes*.
- ☐ Shut down the SQL\*Net network listener and any other Oracle-based applications.
- ☐ If you choose the Oracle Network Manager for Windows option instead of SQL\*Net Easy Configuration, have your *Oracle Network Products User's Guide for Windows* and *Oracle Network Manager Administrator's Guide* ready.
- ☐ Perform all SQL\*Net version 2.x pre-installation tasks described under the "Caution" note at the beginning of the sections "CD-ROM Quick Start Installation Instructions" or "CD-ROM Detailed Installation Instructions".

CD-ROM Quick Start Installation Instructions

Perform the tasks in the “Before You Install” section of this chapter. For more detailed steps, see the section “CD-ROM Detailed Installation Instructions.”

**Caution:** If you previously used SQL\*Net version 2.x, perform these tasks before beginning installation:

- Back up all SQL\*Net version 2.x server configuration files before performing an installation. With each server (re-)installation, SQL\*Net Easy Configuration automatically runs, the LISTENER.ORA file in the ORACLE\_HOME\NETWORK\ADMIN directory is renamed LISTENER.OLD, and a new LISTENER.ORA file is created.
  - Back up TNSNAMES.ORA before performing a client installation if you plan to run SQL\*Net Easy Configuration multiple times.
  - De-install all SQL\*Net client and server products.
1. Insert the CD-ROM for Oracle7 Products for Windows NT or for Oracle7 Products for Windows 95 into the CD-ROM drive.
  2. Run the Oracle Installer:

<i>For...</i>	<i>Enter...</i>
Windows NT (Intel)	G:\NT_X86\INSTALL\ORAINST or G:\NT_X86\INSTALL\SETUP
Windows NT (MIPS)	G:\NT_MIPS\INSTALL\ORAINST or G:\NT_MIPS\INSTALL\SETUP
Windows 95	G:\WIN95\INSTALL\ORAINST or G:\WIN95\INSTALL\SETUP

where G: is the drive letter of your CD-ROM.

3. Follow the on-screen directions about language, company, and ORACLE\_HOME directory.  
The Software Asset Manager dialog box displays the available installation options.
4. Select appropriate options for installation and choose [Install].
5. Follow the onscreen installation instructions.



**Note:** If you only select SQL\*Net for installation, you *must* install an appropriate Oracle Protocol Adapter when prompted.

**CD-ROM Detailed Installation Instructions**

Perform the tasks in the “Before You Install” checklist section of this chapter.

**Caution:** If you previously used SQL\*Net version 2.x, perform these tasks before beginning installation:

- Back up all SQL\*Net version 2.x server configuration files before performing an installation. With each server (re-)installation, SQL\*Net Easy Configuration automatically runs, the LISTENER.ORA file in the ORACLE\_HOME\NETWORK\ADMIN directory is renamed LISTENER.OLD, and a new LISTENER.ORA file is created.
  - Back up TNSNAMES.ORA before performing a client installation if you plan to run SQL\*Net Easy Configuration multiple times.
  - De-install all SQL\*Net client and server products.
1. Insert the CD-ROM for Oracle7 Products for Windows NT or for Oracle7 Products for Windows 95 into the CD-ROM drive.
  2. Verify that the CD-ROM reader is mapped to a drive and that its files are accessible.
  3. Run the Oracle Installer:

<i>For...</i>	<i>Enter...</i>
Windows NT (Intel)	G:\NT_X86\INSTALL\ORAINST or G:\NT_X86\INSTALL\SETUP
Windows NT (MIPS)	G:\NT_MIPS\INSTALL\ORAINST or G:\NT_MIPS\INSTALL\SETUP
Windows 95	G:\WIN95\INSTALL\ORAINST or G:\WIN95\INSTALL\SETUP


where G: is the drive letter of your CD-ROM.

The Language dialog box appears.

4. Select the language and choose OK.

The Oracle Installation Settings dialog box appears.

5. Enter your company name and the location of your ORACLE\_HOME directory.

 **Attention:** If you change your ORACLE\_HOME directory location, all previously installed products for that ORACLE\_HOME are disabled.

The Software Asset Manager dialog box appears.

6. Follow the appropriate operating system installation instructions:

<i><b>For...</b></i>	<i><b>Refer to this Page for Installation Instructions...</b></i>
Windows NT	2 – 7
Windows 95	2 – 10

#### **If running Windows NT:**

The Software Asset Manager dialog box displays a number of installation options, four of which allow you to install Oracle networking products:

<i><b>Option</b></i>	<i><b>This Option Lets You...</b></i>
<ul style="list-style-type: none"><li>• Networking Products</li></ul>	Selectively install the following products. <ul style="list-style-type: none"><li>• Oracle Names Server</li><li>• SQL*Net Client</li><li>• SQL*Net Protocol Adapters</li><li>• SQL*Net Server</li></ul>
<ul style="list-style-type: none"><li>• Oracle7 Client</li></ul>	Select the Database Administrator or Application User suboption. Both suboptions display a series of products automatically selected for installation, including the following client networking products: <ul style="list-style-type: none"><li>• SQL*Net Client</li><li>• SQL*Net Protocol Adapters</li></ul>

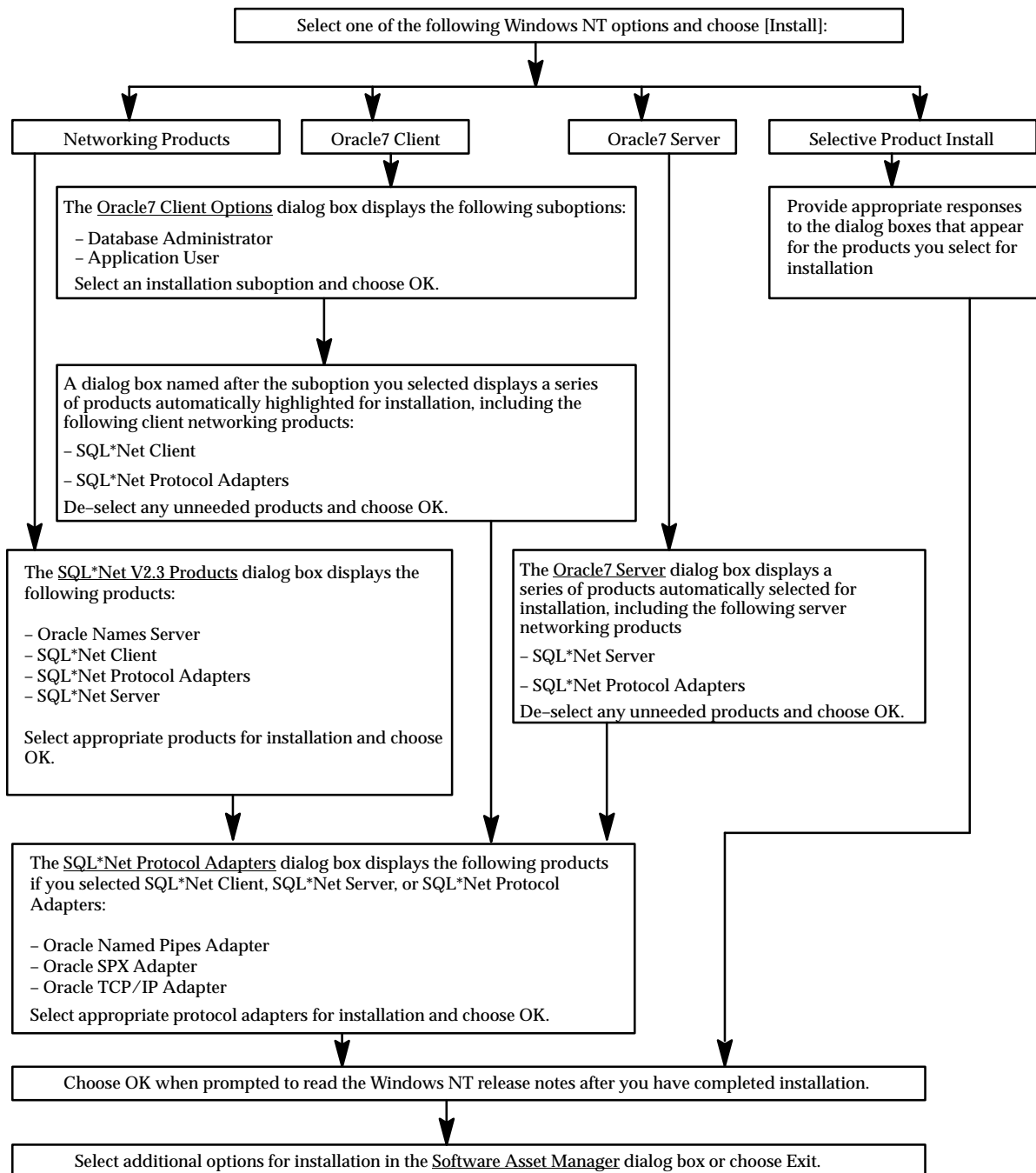
<b><i>Option</i></b>	<b><i>This Option Lets You...</i></b>
<ul style="list-style-type: none"> <li>• Oracle7 Server</li> </ul>	Automatically install a series of products, including the following server networking products: <ul style="list-style-type: none"> <li>• SQL*Net Server</li> <li>• SQL*Net Protocol Adapters</li> </ul>
<ul style="list-style-type: none"> <li>• Selective Product Install</li> </ul>	Selectively install all Oracle client and server network products for Windows NT.

**Note:** If you only select SQL\*Net Server or SQL\*Net Client for installation, you *must* install an appropriate Oracle Protocol Adapter when prompted.

**Note:** You can choose Cancel at any time to terminate installation and return to the Software Asset Manager dialog box.

1. Follow the arrows in the diagram below to install these options.

**Note:** These installation procedures describe only Oracle network products dialog boxes. Depending upon the options you select, dialog boxes for other Oracle products can appear.



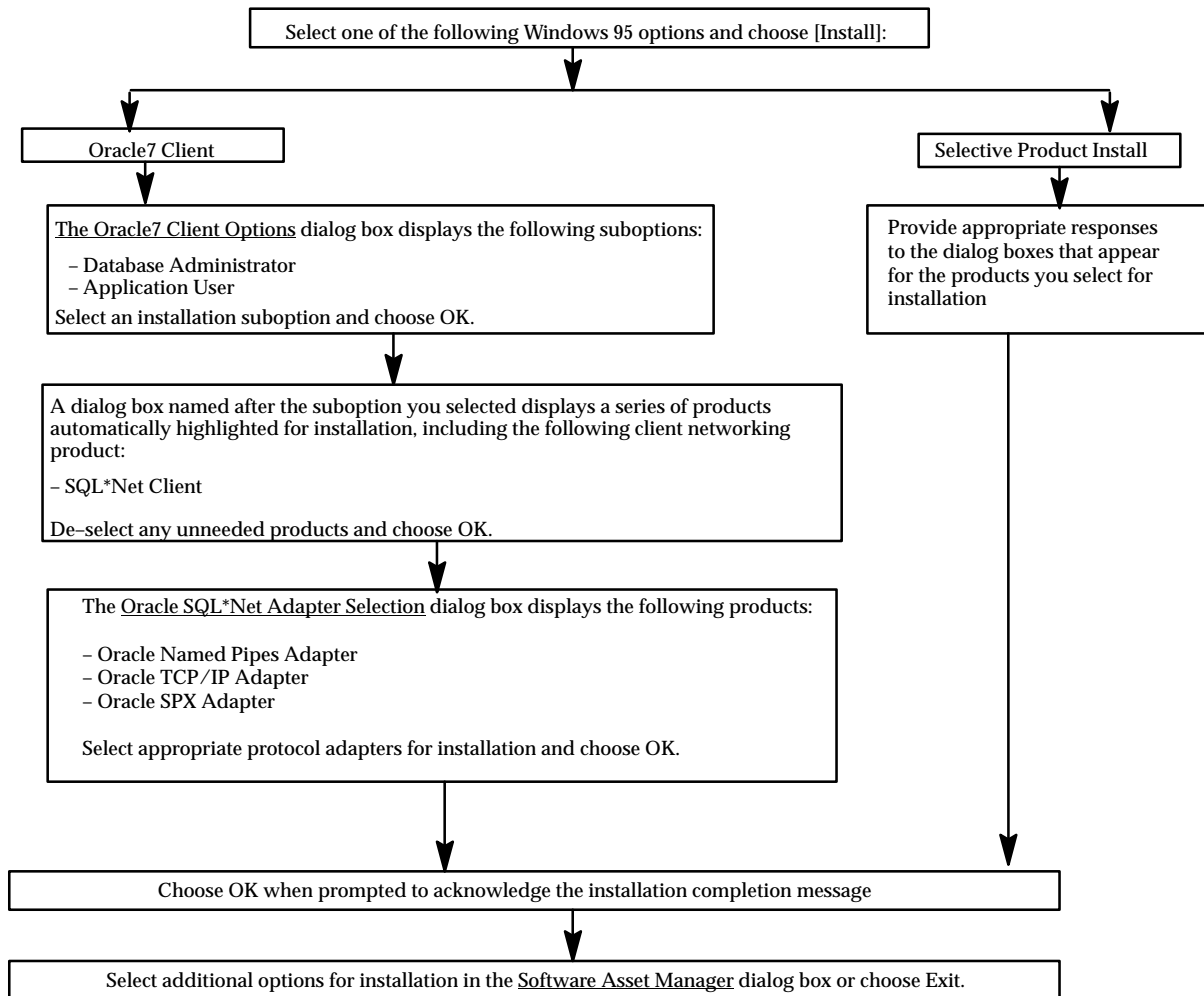
**If running Windows 95:**

The Software Asset Manager dialog box displays the following Oracle networking product options:

<i><b>Option</b></i>	<i><b>This Option Lets You...</b></i>
<ul style="list-style-type: none"><li>• Oracle7 Client</li></ul>	Select the Database Administrator or Application User suboption. Both suboptions display a series of products automatically selected for installation, including SQL*Net Client.
<ul style="list-style-type: none"><li>• Selective Product Install</li></ul>	Selectively install all Oracle client network products for Windows 95.

1. Follow the arrows in the diagram below to install these options.

**Note:** These installation procedures describe only Oracle network products dialog boxes. Depending upon the options you select, dialog boxes for other Oracle products can appear.



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## Installing and Viewing Adobe Acrobat Online Documentation

The SQL\*Net documentation listed in the Preface can be viewed online in Adobe Acrobat portable document format (PDF). Adobe Acrobat PDF documentation can be:

- Installed on your hard drive or left on the CD-ROM for viewing.
- Accessed through an Oracle Online Documentation Library that lets you choose appropriate documents for viewing, regardless of

whether they are installed on your hard drive or remain on the CD-ROM.

Follow these procedures to install and view Adobe Acrobat documentation.

1. Follow the installation procedures described earlier to access the Software Asset Manager dialog box.

The Software Asset Manager dialog box displays all options available for installation.

2. Select Oracle Documentation and choose Install.
3. Select whether to install Adobe Acrobat documentation on your hard drive or leave it on the CD-ROM and choose OK.

**Note:** Adobe Acrobat documentation can remain on the CD-ROM for viewing.

**Note:** The amount of disk space required displays onscreen.

Installation begins.

4. Choose OK when prompted to acknowledge that installation is complete.
5. Exit the Oracle Installer.
6. Choose OK to acknowledge the message stating that you must install the Adobe Acrobat Reader by running the ACROREAD.EXE file. This file is located in the \ACROBAT directory of the CD-ROM.

An Oracle Documentation icon is created in your Oracle for Windows NT or Oracle for Windows 95 icon.

7. Double-click the G:\ACROBAT\ACROREAD.EXE file in Windows File Manager (for Windows NT) or Windows Explorer (for Windows 95).
8. Follow the onscreen instructions.

The Adobe Acrobat Reader is installed.

9. Double-click the Oracle Documentation icon to access the Oracle Online Documentation Library that lists all documents available for viewing.

---

## Installing the Oracle Network Manager for Windows

If SQL\*Net Easy Configuration is the standard for your network environment, you have completed the installation tasks. Proceed to Chapter 3.

If Oracle Network Manager for Windows is the standard for your workgroup network, proceed to the next step.

1. Go to the installation chapter of the *Oracle Network Products User's Guide for Windows*.
2. Follow the instructions to run the Oracle Installer for Windows.
3. Install the Oracle Network Manager for Windows from the Oracle Products for Windows CD.
4. Return to this manual for further guidance on Oracle network products for Windows NT/Windows 95.

**Note:** If you had a previous SQL\*Net version 2.x configuration, you may need to restore LISTENER.OLD in the ORACLE\_HOME\NETWORK\ADMIN directory.

---

## De-Installing Products

Follow these instructions to de-install products:

1. Select one of the following tools:

***For...***

Windows NT

Windows 95

***Choose...***

File Manager from the Windows NT Program Manager.

Windows Explorer

2. Choose the drive on which you installed the Oracle network products.
3. Choose the ORACLE\_HOME directory icon.

***For...***

Windows NT

Windows 95

***Choose...***

ORANT

ORAWIN95

4. Choose the BIN directory icon.
5. Double-click ORAINST.EXE.



6. The Software Asset Manager dialog box displays the currently installed products in the menu on the right side of the screen.
7. Select the products to de-install and choose Remove.
8. Provide responses to any messages that appear.
9. Choose Exit to exit the Oracle Installer.
10. Confirm your selection when prompted.

# Using SQL\*Net Easy Configuration

**T**his chapter describes the following SQL\*Net Easy Configuration issues:

- Overview
- Starting SQL\*Net Easy Configuration
- Using SQL\*Net Easy Configuration

---

## Overview

SQL\*Net Easy Configuration is a SQL\*Net version 2 utility that allows user to configure SQL\*Net automatically on client machine(s). Use SQL\*Net Easy Configuration if you know the name of your server and your system ID (SID). This is the case for many users who formerly used SQL\*Net version 1.

**Note:** If you are a network administrator setting up a network with the Oracle MultiProtocol Interchange (MPI), Oracle Names, Secure Network Services (SNS), or facilities for users who do not know the name of their server, do the following:

- use Oracle Network Manager for Windows instead of SQL\*Net Easy Configuration
- see Appendices D and E.

---

## Starting SQL\*Net Easy Configuration

**Caution:** Oracle strongly recommends that every machine in the workgroup network be configured with only one of the configuration utilities: SQL\*Net Easy Configuration or Oracle Network Manager for Windows.

**Caution:** SQL\*Net Easy Configuration and Oracle Network Manager for Windows are mutually exclusive on any one machine.

**Note:** The Cancel button, which is found in every dialog box, deletes any changes made since the last confirmation and exits the utility.

Follow these instructions to start SQL\*Net Easy Configuration.

1. Verify that SQL\*Net is installed on your client.
2. Verify Oracle Protocol Adapters installation.
3. Open SQL\*Net Easy Configuration:

**For Windows NT**

Double-click the SQL\*Net Easy Configuration icon in the Oracle for Windows NT program group.

**For Windows 95**

Select Start, Programs, Oracle for Windows 95, and choose SQL\*Net Easy Configuration.

---

## Using SQL\*Net Easy Configuration

The SQL\*Net Easy Configuration dialog box appears after you choose the Oracle SQL\*Net Easy Configuration icon.

The SQL\*Net Easy Configuration dialog box allows you to:

- add a database alias
- modify a database alias
- delete a database alias
- view the configuration information
- exit SQL\*Net Easy Configuration (for Windows 95)

**Note:** For Windows NT, use the Cancel button to exit.

**Note:** When you start SQL\*Net Easy Configuration for clients for the first time, any existing ORACLE\_HOME\NETWORK\ADMIN\TNSNAMES.ORA file is backed up as ORACLE\_HOME\NETWORK\ADMIN\TNSNAMES.OLD.

**Note:** When you start SQL\*Net Easy Configuration for clients for the first time, it does not use the existing configuration file. You must (re-)enter any configuration information the first time you use SQL\*Net Easy Configuration for clients.

**Note:** If you want to delete, modify, or view Bequeath Protocol Adapter addressing information, use SQL\*Net Easy Configuration. The Bequeath Protocol Adapter is automatically installed with SQL\*Net Client on Windows NT. Refer to Chapter 4 for a description of Bequeath Protocol Adapter features.

### Adding a Database Alias

1. Select Add Database Alias.
2. Choose OK.

The Choose Database Alias dialog box appears.

3. Enter a Database Alias name to identify the remote database to access. The alias can be any name you choose.

**Note:** The name must have at least one alphabetical character.

4. Choose OK.

The Choose Protocol dialog box appears if more than one supported Oracle Protocol Adapter resides in your

ORACLE\_HOME directory. If not, one of the dialog boxes listed in Step 6 appears and you must go to Step 7.

5. Select the protocol to use for your Database Alias name.
6. Choose OK.

The dialog box appropriate for your protocol adapter appears:

- Choose TCP/IP Host Name
- Choose SPX Service Name
- Choose Named Pipes Server Name

7. Enter the appropriate service name corresponding to one of the following:

- TCP/IP Host Name
- SPX/IPX Service Name
- Named Pipes Server Name

8. Choose OK.

The Confirm Adding Database Alias dialog box appears.

9. Choose OK to confirm (Yes).

The SQL\*Net Easy Configuration dialog box re-appears.

## **Modifying a Database Alias**

1. Select Modify Database Alias from the SQL\*Net Easy Configuration dialog box.
2. Choose OK.

The Modify Database Alias dialog box appears with the list of Database Aliases (if any).

3. Choose the Database Alias to modify.
4. Choose OK.

The dialog box appropriate to your protocol adapter appears if more than one supported Oracle protocol adapter resides in your ORACLE\_HOME directory. If not, the Enter Modification Information dialog box appears and you must go to step 7.

5. Select the protocol to use for your Database Alias name.
6. Choose OK.

The Enter Modification Information dialog box appears.

7. Enter the appropriate service name that corresponds to one of the following:
  - TCP/IP Host Name
  - SPX/IPX Service Name
  - Named Pipes Server Name
8. Accept the default Database Instance name, ORCL, or type the Database Instance name you want.

**Note:** The name requires at least one alphabetical character.

**Note:** If you used SQL\*Net version 1 in the past, you can use the same values for Service Name and Database Instance (SID) as you used for SQL\*Net version 1. If you do not know this information, ask the person who administers your network or remote database.
9. Choose OK.

The Confirm Modifying Database Alias dialog box appears.
10. Choose Yes to modify the Database Alias.

The SQL\*Net Easy Configuration dialog box re–appears.

## Deleting a Database Alias

1. Select Delete Database Alias.
2. Choose OK.

The Delete Database Alias dialog box appears with the list of Database Aliases.
3. Select the Database Alias to delete.
4. Choose OK.

The Confirm Deleting Database Alias dialog box appears with the configuration information for that Database Alias.
5. Select Yes and choose OK to delete that Database Alias.

The SQL\*Net Easy Configuration dialog box re–appears.

## Viewing Configuration Information

1. Select View Configuration Information.
2. Choose OK.

The Choose Database Alias dialog appears with a list of databases.

3. Select the database alias to view.

4. Choose OK.

The Configuration Information dialog box appears with the entries for that database alias.

5. Choose OK.

The SQL\*Net Easy Configuration dialog box re-appears.

## **Exiting the Utility**

Choose the Exit button, and OK, if you have finished adding, modifying, deleting, or viewing configuration information.

# Using Oracle Network Products

**A**fter Oracle network products are installed and configured, you can communicate across a network with SQL\*Net. This chapter covers the following topics:

- verifying the network connection
- using SQL\*Net login parameters
- connecting with SQL\*Net
- using SQL\*Net
- connecting to another system
- connecting to a local Windows NT server without a listener

**Note:** This chapter assumes you have already configured Oracle network products with either SQL\*Net Easy Configuration (documented in Chapter 3) or Oracle Network Manager for Windows (documented in Appendix E).



---

## Verifying the Network Connection

Use the TNSPING utility to determine whether or not you can reach a service on a SQL\*Net network. The service can be an Oracle database, an Oracle Names server, or any other Oracle (TNS) service.

When you connect to a TNS service using TNSPING, an estimate of the round trip time in milliseconds appears. If TNSPING fails, a network error message appears without the overhead of a database connection.

Invoke TNSPING on the command line as follows:

```
C:\> tnsping service_name count
```

where:

<i>service_name</i>	must exist in TNSNAMES.ORA or Oracle Names.
<i>count</i>	is optional and determines how many times the program attempts to reach the server.

---

## Using SQL\*Net Login Parameters

The appropriate Oracle Protocol Adapter is used automatically when the *service\_name* used to request a connection specifies that protocol in the configuration file.

The configuration file is set up in one of two ways:

- by the end-user using SQL\*Net Easy Configuration
- by the network administrator using Oracle Network Manager for Windows to set up both the client side and server side of this communication

For the server side, the network administrator establishes and starts a network listener that uses a specific Oracle Protocol Adapter. The network listener listens for requests to connect to the desired database.

You can connect to a server using any Oracle application, such as SQL\*Plus, that prompts you for a username and password.

To open an Oracle application:

- double-click the application icon
- enter the appropriate information in the dialog box

For instance, if you selected SQL\*Plus, a logon dialog box appears requesting *User Name*, *Password* and *Host String*. Enter the correct values, where:

<i>User Name</i>	specifies the username required to connect to the remote database.
<i>Password</i>	specifies the password of the username.
<i>Host String</i>	specifies which service name (comparable to a SQL*Net version 1 connect string) to use for the desired database server. The TNSNAMES.ORA file identifies the easy-to-remember service names mapped to lengthier TNS connect descriptors.

Choose the [Cancel] button at any time to exit the application.

---

## Connecting with SQL\*Net

To connect to a remote database, you enter logon information (SQL\*Net parameters) in a Logon dialog box.

1. Double-click on the Oracle application icon.
2. Enter a `username/password`, such as `SCOTT/TIGER`.
3. Enter the appropriate information in the Host String or Connect field of the Logon dialog box:

YVONNE

where YVONNE is a service name in the TNSNAMES.ORA file in the ORACLE\_HOME\NETWORK\ADMIN subdirectory.

---

## Using SQL\*Net

Once the LISTENER.ORA file is configured for server machines and the TNSNAMES.ORA files are configured for client machines, begin using SQL\*Net. The network administrator or the end-user runs the server's SQL\*Net listener program.

**Note:** The TNSNAMES.ORA file does not exist if Oracle Names is configured with Oracle Network Manager for Windows.

Start the network listener service in either of two ways:

<i><b>From the Command Line</b></i>	<i><b>From within the LSNRCTL Utility</b></i>
<ul style="list-style-type: none"><li>Enter the following: <code>C:\&gt; LSNRCTL START</code></li></ul>	<ul style="list-style-type: none"><li>Enter the following: <code>C:\&gt; LSNRCTL</code></li><li>Enter the following at the LSNRCTL prompt: <code>LSNRCTL&gt; START</code></li></ul>

Once you start the listener, client workstations can connect to a server using a service name, as described in the next section.

**Establishing Client Connections**

Once you have started a SQL\*Net listener on the network, client workstations and other servers connect to the server’s network listener with a service name when logging onto an Oracle7 Server. For example, you can log onto a local Oracle7 Server from within Server Manager with the following syntax:


```
SVRMGR> CONNECT username/password@service_name
```

where *username* and *password* reflect your database account information, and the *service\_name* is mapped to the lengthier connect descriptor defined in TNSNAMES.ORA.

If using a menu-based Oracle tool, such as Oracle Forms, enter the password and SQL\*Net version 2 connect descriptor information in the PASSWORD entry field. You can also input the entire logon information in the username field.

If your tool does not have a third box for Connect or Host String, then type the “at” key (@) after the password, as in the following example:

```
SCOTT/TIGER@YVONNE
```



**Additional Information:** To learn more about establishing client connections, see *Understanding SQL\*Net*.

---

**Connecting to Another System**

The SQL\*Plus CONNECT command is normally used to connect to another Oracle username on the current database. You can also use CONNECT with SQL\*Net parameters to connect to a different database.

The syntax for using a service name is:

```
SQL> CONNECT username/password@service_name
```

The example below uses the slash (/) and “at” (@) separators to connect SQL\*Plus user SCOTT with password TIGER to remote database YVONNE:

```
SQL> CONNECT SCOTT/TIGER@YVONNE
```

The CONNECT command commits all pending work in the current database and logs off the current username.

**Note:** With SQL\*Plus, you can log on to only one database at a time. SQL\*Plus allows you to start up multiple copies (sessions), with each individual session logged on to a different database.

---

## Connecting to a Local Windows NT Server without a Listener

SQL\*Net for Windows NT version 2.3 includes a new feature called the Bequeath Protocol Adapter. The Bequeath Protocol Adapter:

- does not use a listener (therefore, no server configuration is required)
- is used for local connections where a Windows NT client application (such as SQL\*Plus) communicates with a Windows NT server running on the *same* machine.

The Bequeath Protocol Adapter address format in the TNSNAMES.ORA file is shown below. If you want to modify, delete, or view this address information, use SQL\*Net Easy Configuration.

```
(COMMUNITY=beq.world)
(PROTOCOL=BEQ)
(PROGRAM=oracle73)
(ARGV0=oracle73ORCL)
(ARGS= ' (DESCRIPTION=(LOCAL=YES) (ADDRESS=(PROTOCOL=beq))) ' )
```

**Note:** When connecting with the Bequeath Protocol Adapter on a local Windows NT server, you only need to specify the SID. Use the default entry of localhost for the service name, since the Windows NT server is a local machine.



# A

## Oracle Installer Error Messages

**T**his appendix lists potential error messages, probable causes of errors, and corrective actions to take for the following:

- Oracle Installer

**Note:** Most Oracle Installer error messages display onscreen diagnostic information and are not listed in this appendix.

---

## Oracle Installer

### DISK\_FULL

**Cause** Indicates there is not enough disk space on the destination volume to copy the selected program.

**Action** Create space on the destination volume.

### FILE\_NOT\_FOUND

**Cause** It was not possible to locate a file on the source or destination media.

**Action** Run a utility program to locate any problems with the source or destination media; the media can be the CD-ROM drive, a network drive, or a floppy drive.

### OS\_ERROR

**Cause** There is an unexpected operating system error.

**Action** Run a utility program to locate any problems with the source or destination media; the media can be the CD-ROM drive, a network drive, or a floppy drive.

### PERMISSION\_DENIED

**Cause** The network has denied permission to perform the selected action.

**Action** Check with the network administrator; make sure that you have supervisor privileges and can perform the selected action.

**Cause** There is a fileshare problem with the TSR program SHARE.EXE.

**Action** Modify AUTOEXEC.BAT to increase the number of files to share.

**Cause** There is a conflict between DR DOS 6.0 and Windows 3.1.

**Action** Use a different version of DOS.

### READ\_ERROR

**Cause** A problem has been detected on the source or destination media while executing an I/O operation.

**Action** If in a network environment, verify that you have read permission for the networked file.

**Action** Run a utility program to locate any problems with the source or destination media; the media can be the CD-ROM drive, a network drive, or a disk drive.

## **WRITE\_ERROR**

- Cause** Indicates that either (1) there is not enough disk space on the destination volume to copy the selected program, or (2) a problem has been detected on the destination media while executing an I/O operation.
- Action** Create space on the destination volume.
- Action** If you are in a network environment and installing onto the network, verify that you have permission to write to a network directory.
- Action** Run a utility program to locate any problems with the source or destination media; the media can be the CD-ROM drive, a network drive, or a disk drive.





# *B*

## Registry for Windows NT and Windows 95

**T**his appendix describes how to access the following Registries to edit Oracle-related settings. Specific topics discussed are:

- Overview
- Windows NT Registry
- Windows 95 Registry

---

## Overview

The Registry stores system settings, including Oracle-related settings. The end-user who uses SQL\*Net Easy Configuration does not need to edit the Registry. The network administrator, however, can customize the Oracle environment by changing the parameters defined in the Registry.

**Caution:** When editing in the Registry, proceed carefully to avoid deleting or altering correct information that can affect how your system functions.



**Additional Information:** Refer to your operating system documentation for more information.

---

## Windows NT Registry

These procedures describe how to edit the Windows NT Registry for Oracle-related settings.

1. Type REGEDT32 from a command line.  
Four windows appear, including HKEY\_LOCAL\_MACHINE.
2. Activate HKEY\_LOCAL\_MACHINE on the Local Machine window.
3. Double-click on Software.
4. Double-click on ORACLE.

A list of values appears in the right-hand side on the window.

5. Double-click on the value to edit.

The String Editor dialog box appears.

6. Make any edits in the String field.
7. Choose OK.
8. Reboot your system for changes to take effect.

---

## Windows 95 Registry

These procedures describe how to edit the Windows 95 Registry for Oracle-related settings.

1. Type `REGEDIT` from a command line.

The Registry Editor window appears.

2. Double-click on the `HKEY_LOCAL_MACHINE` folder located under My Computer.
3. Double-click on `SOFTWARE`.
4. Double-click on `ORACLE`.

A list of values appears in the right-hand side on the window.

5. Double-click on the value to edit.

The Edit String dialog box appears.

6. Make any edits in the appropriate field(s).
7. Choose OK.
8. Reboot your system for changes to take effect.



## C

# Sample Configuration Files

**S**ample configuration files make it easier to understand how to configure Oracle Network Products. This appendix provides examples of the following files:

- SQLNET.ORA
- LISTENER.ORA
- TNSNAMES.ORA



**Attention:** Oracle only supports configuration files created by Oracle Network Manager for Windows or SQL\*Net Easy Configuration. Some manual editing of certain files may be a necessary exception.

**Note:** The TNSNAMES.ORA file does not exist if Oracle Names is configured with Oracle Network Manager for Windows.

---

## SQLNET.ORA

```
#####
# Filename.....: sqlnet.ora
# Name.....: ASTERIX.world
# Date.....: 11-JUL-95 14:11:25
#####
AUTOMATIC_IPC = ON
TRACE_LEVEL_CLIENT = OFF
SQLNET.EXPIRE_TIME = 0
NAMES.DEFAULT_DOMAIN = world
NAME.DEFAULT_ZONE = world
SQLNET.CRYPTO_SEED = "-1055358555-1054669637"
SQLNET.AUTHENTICATION_SERVICES = (ALL)
```

---

## LISTENER.ORA

```
#####
# Filename.....: listener.ora
# Name.....: ASTERIX.world
# Date.....: 11-JUL-95 14:11:25
#####
LISTENER =
  (ADDRESS_LIST =
    (ADDRESS=
      (PROTOCOL=IPC)
      (KEY= ASTERIX.world)
    )
    (ADDRESS=
      (PROTOCOL=IPC)
      (KEY= ORCL)
    )
  )
  (ADDRESS =
    (COMMUNITY = TCP.world)
    (PROTOCOL = TCP)
    (Host = ASTERIX)
    (Port = 1521)
```

```

        )
    )
STARTUP_WAIT_TIME_LISTENER = 0
CONNECT_TIMEOUT_LISTENER = 10
TRACE_LEVEL_LISTENER = OFF
SID_LIST_LISTENER =
    (SID_LIST =
        (SID_DESC =
            (SID_NAME = ORCL)
            (PROGRAM = oracle72)
            (PRESPAWN_MAX = 10)
        )
    )
)

```

---

## TNSNAMES.ORA

```

#####
# Filename.....: tnsnames.ora
# Name.....: ASTERIX.world
# Date.....: 11-JUL-95 14:11:25
#####
ASTERIX.world =
    (DESCRIPTION =
        (ADDRESS_LIST =
            (ADDRESS =
                (COMMUNITY = TCP.world)
                (PROTOCOL = TCP)
                (Host = ASTERIX)
                (Port = 1521)
            )
        )
    )
    (CONNECT_DATA =
        (SID = ORCL)
        (GLOBAL_NAME = ASTERIX.world)
    )
)
GETAFIX.world =

```



```
(DESCRIPTION =  
  (ADDRESS_LIST =  
    (ADDRESS =  
      (COMMUNITY = TCP.world)  
      (PROTOCOL = TCP)  
      (Host = GETAFIX)  
      (Port = 1526)  
    )  
  )  
  (CONNECT_DATA =  
    (SID = ORCL)  
    (GLOBAL_NAME = GETAFIX.world)  
  )  
)
```

# *D*

## Verifying Installation of Oracle Network Products

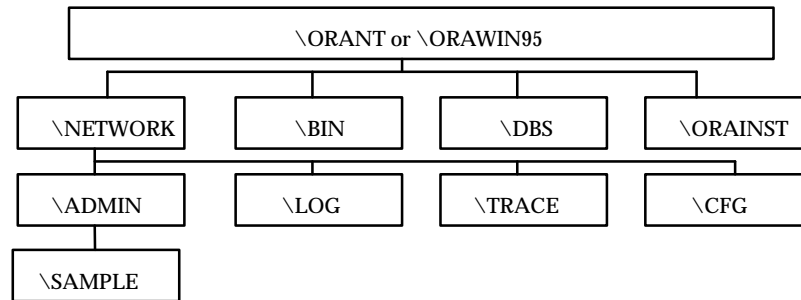
**T**his appendix describes how to verify successful installation of Oracle Network Products for Windows NT/Windows 95. If any files are missing, see Chapter 2 of this Guide for (re)installation instructions. Specifically, this appendix covers the following topics and tasks:

- directory structure of Oracle network products
- installation verification overview
- verifying installation of SQL\*Net files
- verifying installation of other Oracle network product files
- verifying environment setup

---

## Directory Structure of Oracle Network Products

This diagram shows the Oracle Network Products for Windows NT and Oracle Network Products for Windows 95 directory structure.



**\ORANT or \ORAWIN95** the default name of the Oracle home directory, also referred to as ORACLE\_HOME.

**\BIN** holds executable programs, .DLLs, and batch files for Oracle tools used by SQL\*Net and the Oracle Protocol Adapter.

**\DBS** holds messages and scripts.

**\ORAINST** holds files used by the Oracle Installer.

**\NETWORK** created when you install SQL\*Net for version 2.

The **\NETWORK** directory contains the following subdirectories:

**\ADMIN** holds the \*.ORA files used by SQL\*Net version 2.

**\ADMIN\SAMPLE** holds the sample configuration files.

**\LOG** holds log files placed here by default.

**\TRACE** holds trace files placed here by default.

**\CFG** is the SQL\*Net Easy Configuration working directory.

---

# Installation Verification Overview

After you install Oracle network products, verify installation of files and settings of system file parameters, including third-party software, before you begin configuring and using Oracle network products.

This appendix outlines the steps to verify successful installation of Oracle network products, including:

- Oracle Protocol Adapters
- SQL\*Net
- Oracle Network Manager for Windows
- Oracle Names

Locate the appropriate sections in this appendix to accomplish each step as they apply to your configuration needs. After you verify installation, see Appendix E to specify SQL\*Net connect descriptors and Oracle Protocol Adapter addresses.

---

## Verifying Installation of SQL\*Net Files

This section explains how to verify the proper installation of SQL\*Net .DLL files, message files, and server executables.

### Verifying SQL\*Net for DLLs

Before configuring the Oracle Protocol Adapter and SQL\*Net, check that SQL\*Net is fully installed in your \BIN subdirectory. Enter the following command at the prompt:

```
C:\> DIR \ORANT\BIN\*.DLL
```

or

```
C:\> DIR \ORAWIN95\BIN\*.DLL
```

The following dynamic link libraries (DLLs) appear:

**Note:** The files listed below are for *both* SQL\*Net client and server machines unless specifically stated otherwise.

File Name	Server File	Client File
NLNT.DLL	Yes	Yes
NSNT.DLL	Yes	Yes

<b>File Name</b>	<b>Server File</b>	<b>Client File</b>
NTNT.DLL	Yes	Yes
NTPNT.DLL	Yes	No
NTUSNT.DLL	Yes	No
SQLTNSNT.DLL	Yes	Yes
NASNS.DLL	Yes	No
NCRNT.DLL	Yes	No
NMCPI.DLL	Yes	No
NAUNTS.DLL	Yes	Yes

## Verifying Message Files

Enter the following command to verify that the message files listed below are located under the \ORANT\DBS or \ORAWIN95\DBS subdirectory:

```
C:\> DIR \ORANT\DBS\*.MSB
```

or

```
C:\> DIR \ORAWIN95\DBS\*.MSB
```

The following message files appear:

NLUS.MSB	NPLUS.MSB
NMPUS.MSB	SNLUS.MSB
NNCUS.MSB	TNSUS.MSB

If using a language other than American English, the letters corresponding to the language you selected, such as "NL" (Netherlands), replace the "US" in each filename.

## Verifying Server Executables

If you installed SQL\*Net Server, verify that the server executable files listed below are in your \ORACLE\_HOME\BIN directory. Enter the following command:

```
C:> DIR \ORANT\BIN\*.EXE
```

or

```
C:> DIR \ORAWIN95\BIN\*.EXE
```

The following server executables appear:

- TNSLSNR.EXE
- LSNRCTL.EXE

## Verifying Oracle Names Files

If you installed Oracle Names (optional), verify that the Oracle Names executables are in the ORACLE\_HOME\BIN directory. Enter the following command:

```
C:> DIR \ORANT\BIN\*.EXE
```

or

```
C:> DIR \ORAWIN95\BIN\*.EXE
```

The following Oracle Names executables appear:

- NAMES.EXE
- NAMESCTL.EXE

Verify that the message files are in the \ORACLE\_HOME\DBS directory by entering the following command:

```
C:> DIR \ORANT\DBS\*.MSB
```

or

```
C:> DIR \ORAWIN95\DBS\*.MSB
```

The following message files appear:

- NNOUS.MSB
- >NNLUS.MSB
- NMRUS.MSB
- NNCUS.MSB



Oracle Names

Read the *Oracle Names Administrator's Guide* to plan your use of Oracle Names. Most of the necessary decisions are part of the process of installing and configuring SQL\*Net using Oracle Network Manager for Windows. However, Oracle Names requires additional decisions about domains, regions, Names Servers, and database links.

Verifying installation of the dynamic link library (.DLL) file corresponding to the Oracle Protocol Adapter is a two-step process.

**Step 1** Enter the following command:

```
C:> DIR\ORANT\BIN\NT*.DLL
```

**Step 2** Use this table to verify the presence of the file that corresponds to the Oracle Protocol Adapter you installed:

<i>If you installed</i>	<i>Then the corresponding .DLL file is</i>
Oracle Named Pipes Protocol Adapter	NTNNT.DLL
Oracle SPX Protocol Adapter	NTSNT.DLL
Oracle TCP/IP Protocol Adapter	NTTNT.DLL

---

## Verifying Installation of Other Oracle Network Product Files

### Oracle Network Manager for Windows .EXE Files

Use Windows File Manager to verify that Oracle Network Manager for Windows executable (.EXE) files are in the \ORAWIN\BIN subdirectory.

The following .EXE filenames appear:

```
NETCONV.EXE
NETFETCH.EXE
NETMAN.EXE
NETPRINT.EXE
```

To verify files at the DOS prompt, type:

```
C:\> DIR \ORAWIN\BIN\NET*.EXE
```

### Oracle Network Manager for Windows .DLL Files

Use Windows File Manager to verify that Oracle Network Manager dynamic link library (.DLL) filenames are in the \ORAWIN\BIN subdirectory.

The following .DLL filenames appear:

```
NMCPI.DLL
NMC.DLL
NMO.DLL
```

Verify files at the DOS prompt by entering:

```
C:\> DIR \ORAWIN\BIN\NM*.DLL
```

## Verifying Environment Setup

Use the PATH command to verify that the necessary Oracle files are in your path. At the command prompt, type the following:

```
C :> PATH
```

If SQL\*Net and the Oracle TCP/IP Protocol Adapter are installed to the default home directory on drive C, the following is part of the PATH statement:

```
C : \ORANT\BIN
```

or

```
C : \ORAWIN95\BIN
```

If the correct path to the default Oracle home directory is not in your path, modify the PATH statement of your CONFIG.SYS file to include the proper ORACLE\_HOME\BIN subdirectory.

### Identify the Destination Address for TCP/IP

To make a SQL\*Net connection, specify the destination host's Internet address or a host name.

#### Domain Name Service

Most TCP/IP transports attempt to use the Domain Name Service (DNS) to translate the host name into the host address. If a Domain Name Server is present on your network and the TCP/IP vendor supports DNS, the host name is successfully translated to the host address.

#### Configure the HOSTS File for TCP/IP

Depending on your vendor, workstation configuration, and network configuration, your TCP/IP software can use a HOSTS file to map host names to Internet addresses.

The mapping for each host listed in the HOSTS file is specified on a single line in the following format:

```
internet_address hostname [alias]
```

where

*internet\_address* is the Internet address of the host computer (a four-byte value specified in decimal, octal, or hexadecimal). The system administrator knows the host machine's TCP/IP Internet address.

*hostname* is the name of the host associated with the Internet address.



*alias* is an optional alternate name for the host. You can have more than one alias for any single host. Aliases can be set any time you edit the HOSTS file.

For example, a host named “BOSTONSALES” is referenced in the HOSTS file as follows:

```
89.0.1.100 BOSTONSALES [BOSTON]
```

89.0.1.100 the Internet address of the remote host.

BOSTONSALES the name of the remote host.

BOSTON an optional alias for the BOSTONSALES host.



**Additional Information:** For more information, see the documentation for your third-party network software.

# E

## Configuring Oracle Network Products

**T**his appendix provides information on the following topics:

- configuration steps
- client configuration
- TNSNAMES.ORA overview
- address for each supported Oracle Protocol Adapter
- LISTENER.ORA overview
- Oracle Names configuration (Windows NT only)
- SQLNET.ORA overview
- starting and stopping the network listener



**Attention:** Oracle only supports configuration files created by using SQL\*Net Easy Configuration (for simple database connections) or Oracle Network Manager for Windows (for advanced SQL\*Net features, such as Secure Network Services).

**Caution:** Oracle strongly recommends that every machine in the workgroup network be configured with only one of the configuration utilities: SQL\*Net Easy Configuration or Oracle Network Manager for Windows.

**Caution:** SQL\*Net Easy Configuration and Oracle Network Manager for Windows are mutually exclusive on any one machine.

---

## Configuration Steps

Oracle recommends that you use Oracle Names to facilitate connections.

This section outlines the steps necessary to use Oracle Network Manager for Windows and to connect to your database to configure your SQL\*Net version 2 configuration files.

- Step 1** Read the *Oracle Network Manager Administrator's Guide* for information on all the configuration steps described below. (Chapters 3 and 4 provide key information.)
- Step 2** Use Oracle Network Manager for Windows in the following manner:
1. Start a session.
  2. Make sure you are running in Enhanced mode.
  3. Start Oracle Network Manager for Windows.
  4. Follow the instructions in Chapters 3 and 4 of the *Oracle Network Manager Administrator's Guide*.
  5. Save the network definition to a file or to a database.
    - If Oracle Names is part of the network, you must save the network definition to a database. Oracle recommends that you save your network definition to the ORACLE\_HOME\NETWORK\ADMIN directory.
    - If you want to copy the client files to a Windows workstation, either comment out (REM)—or set to the value of OFF—the AUTOMATIC\_IPC=ON statement in the SQLNET.ORA file.
  6. Generate the network configuration files.
  7. Distribute the network configuration files to the appropriate nodes.
  8. Exit Oracle Network Manager for Windows.
- Step 3** Start the network listener if this is a Windows NT Server by entering the following command at the prompt:
- ```
C:\> LSNRCTL START listener_name
```

**Step 4** Start Oracle Names if you are using it on this server. To do so, change directories into the ORACLE\_HOME\BIN directory, then invoke the Oracle Names executable. Below is an example:

```
C:> CD C:\ORANT\BIN
C:\ORANT\BIN> NAMESCTL START
```



**Additional Information:** For information on how to use Oracle Names, refer to the *Oracle Names Administrator's Guide*.

---

## Client Configuration

Oracle Network Manager ensures that the information in the client configuration files matches that in the server configuration files. There are three client configuration files:

| <i>Configuration File</i> | <i>Description</i>                                                                                                                                                                                                                          |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TNSNAMES.ORA              | contains a list of service names of network destinations (databases and Oracle MultiProtocol Interchanges) mapped to connect descriptors. If an Oracle Names server is used on the network, TNSNAMES.ORA is unnecessary and is not created. |
| TNSNAV.ORA                | contains a list of the communities of which the node is a member. If the client communicates over the Oracle MultiProtocol Interchange, this file is necessary.                                                                             |
| SQLNET.ORA                | contains default domains and several optional parameters.                                                                                                                                                                                   |

Once your network is configured and a SQL\*Net network listener is started on an Oracle7 Server, clients connect to the Oracle7 Server using a SQL\*Net service name. The service name is mapped to the connect descriptor. Connect descriptors define the following attributes of a TNS connection:

- protocol adapter information for the destination server's address
- system ID (SID) for the destination server

---

## TNSNAMES.ORA Overview

The TNSNAMES.ORA file is used by clients and distributed database servers to identify potential destinations: servers or Oracle MultiProtocol Interchanges.

If Oracle Names is used in the network, the TNSNAMES.ORA file is not necessary; the Names servers get the needed information from the network definition stored on a database.

Each entry in the TNSNAMES.ORA file includes two elements:

- a service name
- a connect descriptor

These elements are described in the following sections. In addition, elements in MultiProtocol Interchange addressing are also described.

### Service Names

All connect descriptors are assigned service names in the TNSNAMES.ORA file. The user specifies the service name—a single word rather than the lengthier connect descriptor—to identify the service to which to connect. (These are comparable to the aliases used for connect strings in SQL\*Net version 1.) The TNSNAMES.ORA file consists of a series of service names mapped to TNS connect descriptors.

The service name for a database must be exactly the same as the global database name defined by the system administrator. SQL\*Net limits the total length of a global database name to 64 characters. Of these, up to eight are the DB\_NAME as defined by the database administrator, and the remainder show the service's place in the domain hierarchy (DB\_DOMAIN). The name part of the service name can be longer than eight characters only if the DBA changes the name of the database with a RENAME GLOBAL\_NAME parameter. The total global database name, or service name, must remain at or below 64 characters. See *Oracle7 Server Distributed Systems, Volume I* for more information on creating a global database name.



Oracle

Alternate service names, or aliases, can be assigned to a database service through the TNSNAMES.ORA file. The alternate service names can be names you choose because you find them convenient and easy to remember. For example, if a database is used by two different divisions of a company, Human Resources and Finance, you can map two different service name aliases, "hr" and "finance," to the database. The TNSNAMES.ORA file has three separate entries: a service name that is the same as the global database name, and two aliases, mapped to the same connect descriptor.

**Note:** Although you can have multiple aliases for the same database service, you cannot have multiple listeners for the same database service.

The service name for an Oracle MultiProtocol Interchange is the name of the Oracle MultiProtocol Interchange or its Connection Manager component. Typically, the Oracle MultiProtocol Interchange and the Connection Manager are referred to by the same name.

## Connect Descriptors

Every service requires a connect descriptor. For a database, a connect descriptor describes the location of the network listener and the SID of the database to which to connect. Database connect descriptors typically consist of two sections:

- the listener ADDRESS
- the database SID passed as application CONNECT\_DATA

### ADDRESS Section

The application address is the information required to reach the application within a given protocol environment. It includes the community in which the destination resides, the protocol it uses, and protocol-specific parameters. Oracle Network Manager for Windows automatically provides the correct protocol specific parameters for any protocol you use, but you must provide the appropriate values. For information about the parameter values of a given protocol, see the section “Address for Each Supported Oracle Protocol Adapter.”

**Note:** If you specify a TCP/IP address prefixed with a “0”, it is assumed to be an octal number, not a decimal number. For example, 39.223.72.44 is a decimal number, but 039.223.72.44 is an octal number.

**CONNECT\_DATA Section** SQL\*Net uses the CONNECT\_DATA keyword to denote the SID of the remote database. When SQL\*Net on the server side receives the connection request, TNS passes the CONNECT\_DATA contents to the network listener, which identifies the desired database. For SQL\*Net use, sample CONNECT\_DATA contents can look like:

```
( CONNECT_DATA=
  ( SID=ORCL )
)
```

CONNECT\_DATA is a protocol independent keyword indicating that application-specific data is supplied at connect time. SID specifies the Oracle SID of the database server. You must specify the SID in the CONNECT\_DATA section of the connect descriptor.

## Oracle MultiProtocol Interchange Addresses

A connect descriptor for an Oracle MultiProtocol Interchange consists of only one section, an ADDRESS\_LIST section. The ADDRESS\_LIST section lists all Oracle MultiProtocol Interchange addresses, including the required protocol specific keywords.

There is no CONNECT\_DATA section in the connect descriptor of an Oracle MultiProtocol Interchange.

---

## Address for Each Supported Oracle Protocol Adapter

This section describes the address format for the following Oracle Protocol Adapters:

- Oracle TCP/IP Protocol Adapter
- Oracle SPX Protocol Adapter
- Oracle Named Pipes Protocol Adapter

### TCP/IP Addresses

When using the Oracle TCP/IP Protocol Adapter, specify the address of a TNS-based application as follows:

```
(ADDRESS=
  [ (COMMUNITY=community_name) ]
  (PROTOCOL=TCP)
  (HOST=host_name)
  (PORT=1521)
)
```

COMMUNITY  
(optional)

The COMMUNITY keyword (which is optional) identifies a group of network clients and servers using TNS-based software. A community is a group of machines that use the same transport-level protocol, such as TCP/IP. Machines that share a common protocol are said to be members of the same community. If your network uses an Oracle MultiProtocol Interchange, refer to the Oracle MultiProtocol Interchange documentation to define and use TNS communities.

PROTOCOL

the PROTOCOL keyword indicates the type of network on which the TNS-based application resides. When using the Oracle TCP/IP Protocol Adapter, always use the keyword-value pair PROTOCOL=TCP.

**HOST and PORT**      The TCP/IP *host\_name* and *port\_number* identify a TNS-based application on the network. For example, in the case of SQL\*Net, the *host\_name* is the node on which the database resides and *port\_number* identifies the location of an Oracle7 Server listener. Consult with the network administrator to learn the host names and port numbers of TNS-based applications on your network.

## SQL\*Net Example on a TCP/IP Network

The following is an example of the ADDRESS keyword used with the TNS-based product, SQL\*Net. The example is taken from the SQL\*Net configuration file, TNSNAMES.ORA. TNSNAMES.ORA defines the location of Oracle7 Server machines to which a client can connect.

The entry below is taken from a client machine that connects to a single Oracle7 Server named GREENWOOD on a TCP/IP network.

```
GREEN=(DESCRIPTION=
      (ADDRESS =
        (COMMUNITY = tcp.world)
        (PROTOCOL = TCP)
        (Host = GREENWOOD)
        (Port = 1521)
      )
      (CONNECT_DATA=(SID=ORCL)
      )
    )
```

## SPX/IPX Addresses

When using the Oracle SPX Protocol Adapter, specify the address of a TNS-based application as follows:

```
(ADDRESS=
  [ (COMMUNITY=community_name) ]
  (PROTOCOL=SPX)
  (SERVICE=service_name)
)
```

**COMMUNITY**      The COMMUNITY keyword specifies the network community of the TNS-based application. The COMMUNITY keyword is optional, and is generally used only when the Oracle MultiProtocol Interchange product connects multiple networks. If your network uses an Oracle MultiProtocol Interchange, refer to the Oracle MultiProtocol Interchange documentation to define and use TNS communities.



|          |                                                                                                                                                                                                                                                                                                                |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PROTOCOL | The PROTOCOL keyword indicates the type of network on which the TNS-based application resides. When using the Oracle Adapter, always use the keyword-value pair PROTOCOL=SPX.                                                                                                                                  |
| SERVICE  | The SERVICE defines the name of the TNS-based application on the network. For example, in the case of SQL*Net, the <i>service_name</i> always identifies the name of an Oracle7 Server listener. Consult with your network administrator to learn the service names of TNS-based applications on your network. |

## SQL\*Net Example on a SPX/IPX Network

The following is an example of the ADDRESS keyword used with the TNS-based product, SQL\*Net. The example is taken from the SQL\*Net configuration file, TNSNAMES.ORA. TNSNAMES.ORA defines the location of Oracle7 Server machines to which a client can connect.

The entry below is taken from a client machine that connects to a single Oracle7 Server named GREENWOOD\_LSNR\_1 on an SPX/IPX network.

```
GREEN=(DESCRIPTION=
      (ADDRESS_LIST =
        (ADDRESS =
          (COMMUNITY = SPX.WORLD)
          (PROTOCOL = SPX)
          (SERVICE = GREENWOOD_LSNR_1)
        )
      (CONNECT_DATA=(SID=ORCL)
      )
    )
```

## Named Pipes Addresses

When using the Oracle Named Pipes Protocol Adapter, specify the address of a TNS-based application as follows:

```
(ADDRESS=
  [(COMMUNITY=community_name)]
  (PROTOCOL=NMP)
  (SERVER=server_name)
  (PIPE=pipe_name)
)
```

|           |                                                                                                                                  |
|-----------|----------------------------------------------------------------------------------------------------------------------------------|
| COMMUNITY | The COMMUNITY keyword specifies the network community of the TNS-based application.                                              |
| PROTOCOL  | The PROTOCOL keyword indicates the type of network on which the TNS-based application resides. When using the Oracle Named Pipes |

Protocol Adapter, always use the keyword-value pair `PROTOCOL=NMP`.

|                     |                                                                                                                                                                            |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>SERVER</code> | The <code>SERVER</code> keyword indicates the name of your Oracle7 Server computer.                                                                                        |
| <code>PIPE</code>   | The <code>PIPE</code> keyword indicates the pipe name you use to connect to your Oracle7 Server (the same <code>PIPE</code> keyword you specified on your Oracle7 Server). |

### SQL\*Net Example on a Named Pipes Network

The following is an example of the `ADDRESS` keyword used with the TNS-based product, SQL\*Net. The example is taken from the SQL\*Net configuration file, `TNSNAMES.ORA`. `TNSNAMES.ORA` defines the location of Oracle7 Server machines to which a client can connect.

The file below is taken from a client machine that connects to a single Oracle7 Server named `GREENWOOD` on a Named Pipes network.

```
GREEN= (DESCRIPTION=
        (ADDRESS=
            (COMMUNITY=NMP.WORLD)
            (PROTOCOL=NMP)
            (SERVER=GREENWOOD)
            (PIPE=dbpipe0)
        )
        (CONNECT_DATA= (SID=ORCL)
        )
    )
```

---

## LISTENER.ORA Overview

Before a database server can receive connections from SQL\*Net version 2 (and later) clients, a network listener must be active on the server platform. The configuration file for the network listener is `LISTENER.ORA`, which contains four parts:

- listener name
- definition of the listener address
- description of the databases that use the listener
- parameters that influence the listener's behavior

**Note:** Generate and modify the `LISTENER.ORA` file through the Oracle Network Manager for Windows. Do not edit `LISTENER.ORA` by hand.

## Listener Names

The listener name can be any easy-to-use name. The default listener name is LISTENER, which is the recommended name in a standard installation that requires only one listener on a machine. The listener name must be unique on the network. However, this uniqueness is ensured because the Oracle Network Manager for Windows appends the name of the node and its domain to the listener name you supply. For example, if there is a listener on a node named RACER and a listener on a node named RABBIT, the Oracle Network Manager for Windows appends the node names and the domain to their names so that they are identified as LISTENER\_RACER.WORLD and LISTENER\_RABBIT.WORLD.

The listener name must be unique to the machine. If you have more than one listener on a machine, each requires a unique name. The TURTLE node, for example, might have three listeners with the names:

- LSNR1\_TURTLE.WORLD
- LSNR2\_TURTLE.WORLD
- LSNR3\_TURTLE.WORLD

## IPC Addresses for the Listener (Windows NT Only)

The listener queries for interprocess calls (IPC) and for calls from other nodes. IPC addresses must be included in the LISTENER.ORA file. Oracle Network Manager for Windows generates the IPC entries automatically, without your input.

The IPC address format, which is the same across platforms, is as follows:

```
(ADDRESS=
  (PROTOCOL=IPC)
  (KEY=string)
```

Oracle Network Manager for Windows creates two IPC addresses for each database for which a listener queries. In one, the key value is equal to the service name. This IPC address is used for connections from other applications on the same node. Service names are described in the section "TNSNAMES.ORA Overview." In the other IPC address, the key value is equal to the database SID, which is described in the next section. This IPC address is used by the database dispatcher to identify the listener.

**Note:** If the service name is the same as the SID, only one IPC address is needed, and Oracle Network Manager for Windows generates only one IPC address.

If the network includes Oracle Names, and if you create an alias (a second service name) for the address using Oracle Network Manager for

## Describing the Databases on the Listener

Windows, an IPC address using the alias as a key is included in the LISTENER.ORA file.

The next section of the LISTENER.ORA file describes the database SIDs for which the listener queries. It is made up of keyword–value pairs.

```
SID_LIST_listener_name=( (SID_LIST=
    (SID_DESC=
        (SID_NAME=SID)
        (OS_Oracle_
            environment=db_location)
    )
    [ (SID_DESC=
        (SID_NAME=SID)
        (OS_Oracle_environment=db_location)
    ) ]
[ ] ]
```



OS Doc

The *SID* is the Oracle SID of the database server. In the next keyword–value pair, the keyword is operating system specific: it is indicated here as the variable *OS\_Oracle\_environment*. Its value, indicated here as *db\_location*, is the specific location of the database executables.

The following example is for Windows NT:

```
( ORACLE_HOME=C:\ORANT )
```

Another *OS\_Oracle\_environment* might be:

```
( PROGRAM=ORACLE72 )
```

The following example shows a complete *SID\_LIST\_listener\_name* section for Windows NT:

```
SID_LIST_LISTENER=(SID_LIST=
    (SID_DESC=
        (SID_NAME=db1 )
        ( ORACLE_HOME=C:\ORANT )
    )
    (SID_DESC=
        (SID_NAME=db3 )
        ( ORACLE_HOME=C:\ORANT )
    )
)
```

**Note:** You can create connections to multiple databases in two ways, using one or multiple network listeners: (1) you specifically configure one network listener to multiple

databases; (2) you configure multiple network listeners, each for a specific database. All the listeners on a single machine share one LISTENER.ORA file.



**Attention:** For an example of a LISTENER.ORA file, see Appendix C.

To enable servers to function as clients in a network that includes distributed databases, the servers require their own TNSNAMES.ORA and SQLNET.ORA files.

---

## Oracle Names Configuration (Windows NT Only)

If a network uses Oracle Names, the TNSNAMES.ORA file is not necessary and Oracle Network Manager for Windows does not generate it. Oracle Names requires the executable and library files listed in Appendix D and the NAMES.ORA configuration file generated by Oracle Network Manager for Windows.



**Additional Information:** For a description of the NAMES.ORA file, see the *Oracle Names Administrator's Guide*.

When a network includes Oracle Names, Oracle Network Manager for Windows automatically creates a global database link to every server from every other server in the network. These database links are not in the data dictionary, but rather in the network definition to which the Oracle Names servers refer. The database links thus created do not initially include a CONNECT TO clause, so users reach the linked database using the same usernames and passwords they use to reach the first database. Here is a sample SQL statement illustrating this usage:

```
SQL> SELECT * FROM EMP@Green, DEPT@Red;
```

See *Understanding SQL\*Net* and the *Oracle Names Administrator's Guide* for further explanation and examples.

---

## SQLNET.ORA Overview

The SQLNET.ORA file is created for all clients and nodes on the network. It contains five types of information:

- the amount of time between probes sent to determine whether a client-server connection is still alive (dead connection detection)
- optional tracing and logging parameters

- default domains
- client parameters for use with Oracle Names
- other optional parameters

These parameters are described in the following sections.

## Dead Connection Detection

The optional parameter, `SQLNET.EXPIRE_TIME`, determines how often SQL\*Net sends a probe to verify that a client-server connection is still active. If a client is abnormally terminated, a connection remains open indefinitely unless identified and closed by the system. If you specify this parameter, SQL\*Net sends a probe periodically to determine whether there is an invalid connection to terminate. If it finds a dead connection, or a connection no longer in use, it returns an error, causing the server process to exit.

Specify this parameter in the Connection Expire Time field of the Client Profile property sheet of Oracle Network Manager for Windows. Enter the time, in minutes, between probes for a dead connection. The range of possible values is from one to a very large number. However, a value of approximately 10 is recommended. If no value is entered in this field, the broken connections remain indefinitely.

**Note:** The time set in this parameter is not necessarily the amount of time a dead connection will remain. This parameter sets the time between probes for dead connections. Depending on the underlying protocol, shutting down a dead process can take longer.

Dead connection detection has costs associated with it.

- Additional network traffic is generated to probe for dead connections. A probe packet is very small, but one is sent on each connection at the interval specified in the `SQLNET.EXPIRE_TIME` parameter in the `SQLNET.ORA` file.
- When dead connection detection is enabled, the Oracle7 Server needs to do additional processing to distinguish the connection probing event from other events. You can test the performance of your application with and without the dead connection detection feature enabled.
- For some protocols, the generic SQL\*Net dead connection detection feature is no better than the native mechanism available in the underlying transport protocol. In that case, it is not necessary to enable it.

In short, evaluate carefully whether you benefit from enabling the dead connection detection feature. Turn it on only if necessary.

## Optional Tracing Parameters

If you select any optional tracing parameters in the Client Profile property sheet of Oracle Network Manager for Windows, the following parameters appear in the SQLNET.ORA file:

- TRACE\_LEVEL\_CLIENT
- TRACE\_FILE\_CLIENT
- TRACE\_DIRECTORY\_CLIENT

**Note:** You must create or edit the following manually instead of using Oracle Network Manager for Windows: adding tracing parameters for servers to the SQLNET.ORA file; setting optional logging parameters (to specify non-default log file names or locations for client logs or for server logs).

You can also manually add the following optional tracing parameters for the TNSPING utility to SQLNET.ORA. (They produce messages similar to the SQL\*Net trace parameters mentioned above.)

- TNSPING.TRACE\_LEVEL
- TNSPING.TRACE\_DIRECTORY



Messages

## Default Domains

For more information about the logging and tracing parameters in SQLNET.ORA, See the *Oracle Network Products Troubleshooting Guide*.

Whether or not you use Oracle Names, the SQLNET.ORA file includes a parameter that shows the default domain.

## Oracle Names Parameters

If you use Oracle Names, another parameter, NAMES.PREFERRED\_SERVERS, is required. This parameter includes one or more addresses of the Names servers the client prefers to use. Several optional Oracle Names tracing parameters can also appear; they are described in the *Oracle Names Administrator's Guide*. Use Oracle Network Manager for Windows to create these parameters.

## Additional SQLNET.ORA Parameters

The SQLNET.ORA file is used primarily for specifying the Dead Connection Detection parameter, tracing parameters, and default domain information. However, there are additional optional parameters providing other useful functions. The following parameters must be edited manually in the SQLNET.ORA file; they are not affected by Oracle Network Manager for Windows.

## Turning Off IPCs

If you do not want IPC addresses to be sought automatically on some nodes in your network, add the following parameter to the SQLNET.ORA files for those nodes:

AUTOMATIC\_IPC=OFF

Without this parameter, the default is for a connection that looks for an IPC address.

---

## Starting and Stopping the Network Listener

Make sure the configuration steps in the previous section have been completed.

### Server Operations

For server machines, issue the following command to start the network listener:

```
LSNRCTL START listener_name
```

The network listener only stops when you explicitly stop it. Issue the following command:

```
LSNRCTL STOP listener_name
```

### Client Operations

For client machines, using TCP/IP is an automatic result of using a service name whose connect descriptor specifies TCP/IP. For example, a user of Server Manager can request a connection to a local Windows NT server as follows:

```
SVRMGR> CONNECT username/password@service_name
```

When *service\_name* represents a connect descriptor that specifies TCP/IP, the connection is requested and established using that protocol. No explicit start, load, or call is necessary on a client machine.





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