Forte 4GL System Installation Guide

Release 3.5 of Forte™ 4GL

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Contents

Preface

Organization of This Manual 8
Conventions 9
Command Syntax Conventions 9
TOOL Code Conventions 9
Command Line and Code Examples 9
The Forte Documentation Set 10
Forte 4GL 10
Forte Express 10
Forte WebEnterprise and WebEnterprise Designer 10
Forte Example Programs 11
Viewing and Searching PDF Files 12

1 Installation Overview

About Forte 4GL 14
Forte 4GL Software 14
Forte 4GL–Runtime Only Software 14
Platform Matrix 15
Setting up a Forte 4GL Environment 16
Forte Nodes 16
Preparing for Installation 17
Installing Forte Software 18
Installation Media 19
Forte 4GL Platform CD 19
Forte 4GL–Runtime Only CD 20
Installation Options 20
Installing from a Central Distribution Node 20
Installing from a Local CD-ROM Drive 20

2 Installing Forte on a UNIX Node

Preparing for a Forte Installation 22
Platform Matrix 22
User Accounts and Privileges 22
Types of Installations 23
Forte Environment 24

Installing the Software 25
Mounting the Distribution CD 25
Installing Forte 4GL 26
Installing Forte 4GL–Runtime Only 27
After Installing Forte 29
FORTE_ROOT Directory Structure 29
Install Directory 30
Understanding the fortedef Script 31
Creating and Using fortedef Scripts 31
Forte Environment Variables 32
Understanding the forteboot Script 33
Creating and Using forteboot Scripts 33
Setting the FORTE_FTLAUNCH_PORT Environment Variable 34
Linking Forte with Informix and Sybase 34
Linking Forte with Sybase 35
Linking Forte with Informix on HP 9000 35
Testing Your Installation 36

3 Installing Forte on Windows NT and Windows 2000 Nodes

Preparing for a Forte Installation 38
Platform Matrix 38
User Accounts 38
Administrator Privileges 38
User Account without Administrator Privileges 39
Types of Installations 39
Forte Environment 40
Installing the Software 41
Installing Forte Application Environment 41
Full Distributed Installation 42
Custom Installation 44
Installing Forte 4GL–Runtime Only 49
After Installing Forte 4GL 52
FORTE_ROOT Directory Structure 53
Install Directory under FORTE_ROOT 54
Forte Registry Keys 55
Forte Services 56
Forte Program Group and Shortcuts 56
Forte Distributed Shortcut 57

4 Installing Forte on Windows 98/95 Nodes

Preparing for a Forte Installation 60
Platform Matrix 60
Types of Installations 60
Forte Environment 61

Installing the Software 62
Installing Forte Application Environment 62
Installation Procedures 63
Full Distributed Installation 63
Custom Installation 65
Installing Forte 4GL–Runtime Only 68
After Installing Forte 4GL 71
FORTE_ROOT Directory Structure 71
Install Directory under FORTE_ROOT 72
Forte Registry Keys 73
Forte Program Group and Shortcuts 75
Forte Distributed Shortcut 76

5 Installing Forte on an OpenVMS Node

Preparing for a Forte Installation 80
Platform Matrix 80
Disk Space Requirements 80
Modifying System Parameters 81
Checking Operating System and Software Versions 81
OpenVMS System 81
Motif Runtime Libraries 81
Network Support 82
Compaq C and C++ Compiler and Runtime Libraries 82
Required Target Directory Structure 83
Types of Installations 83
Forte Environment Information 84
Installation Procedures 86
Installing Forte 4GL 86
Installing Forte 4GL–Runtime Only 89
After Installing Forte 92
FORTE_ROOT Directory Structure 92
FORTE_ROOT:[INSTALL] Directory 93
Editing the System Files 94
Editing the OpenVMS System Startup File 94
Editing the System Login File 94
Shutting Down Forte Server Processes 95
Forte User Account Requirements 95
Forte Server Account Requirements 95
Testing Your Installation 97
Configuration Notes 98
Logical Names 98
Search Priority 98
Network Protocols 99
Setting FORTE_LOCATIONS 99
Setting FORTE_NS_ADDRESS 100

6 Installing Forte and the Forte Transaction Adapter on OS/390

Preparing for a Forte Installation 102
Platform Matrix 102
Who Should Install the Software?. 102
Requirements for Installation 103
Installation Options 103
Forte Environment 104
Installation Procedure 106
After Installing Forte 109
FORTE_ROOT Directory Structure 109
Install Directory 110
Understanding the fortedef Script 111
Creating and Using fortedef Scripts 111
Forte Environment Variables 112
Understanding the forteboot Script 113
Testing Forte 114
Customizing Sample Applications for Forte Application Server for OS/390 114
Installing the Transaction Adapter for OS/390 115
Requirements 115
Loading the OS/390 Examples 115
Installation Verification Procedures 116
Installation Verification for APPC/MVS 117
Installation Verification for CICS/ESA and CICS/TS 118
Installation Verification for IMS/TM 120

Preface

This *Forte 4GL System Installation Guide* explains how to install Forte 4GL software and Forte 4GL–Runtime Only software on supported platforms.

Chapter 1, "Installation Overview" provides a brief description of the Forte system software. Subsequent chapters contain platform-specific installation procedures and additional information about Forte system software.

Refer to the platform matrix at http://www.forte.com/support/platforms.html for a list of supported platforms and their requirements.

Organization of This Manual

This manual contains the following chapters:

Chapter	Description
Chapter 1, "Installation Overview,"	Provides background information that helps you prepare for installing Forte 4GL or Forte 4GL–Runtime Only software.
Chapter 2, "Installing Forte on a UNIX Node,"	Describes how to install Forte 4GL software and Forte 4GL–Runtime Only software on any supported UNIX platform.
Chapter 3, "Installing Forte on Windows NT and Windows 2000 Nodes,"	Describes how to install Forte 4GL software and Forte 4GL–Runtime Only software on Windows NT and Windows 2000 platforms.
Chapter 4, "Installing Forte on Windows 98/95 Nodes,"	Describes how to install Forte 4GL software and Forte 4GL–Runtime Only software on Windows 98 and Windows 95 platforms.
Chapter 5, "Installing Forte on an OpenVMS Node,"	Describes how to install Forte 4GL software and Forte 4GL–Runtime Only software on OpenVMS systems running on Alpha hardware.
Chapter 6, "Installing Forte and the Forte Transaction Adapter on OS/390,"	Describes how to install Forte 4GL software on an OS/390 node. It also describes how to install the Forte DB2 Adapter for OS/390 and the Forte Transaction Adapter for OS/390.

Conventions

This manual uses standard Forte documentation conventions in specifying command syntax and in documenting TOOL code.

Command Syntax Conventions

The specifications of command syntax in this manual use a “brackets and braces” format. The following table describes this format:

Format	Description
bold	Bold text is a reserved word; type the word exactly as shown.
italics	Italicized text is a generic term that represents a set of options or values. Substitute an appropriate clause or value where you see italic text.
UPPERCASE	Uppercase text represents a constant. Type uppercase text exactly as shown.
underline	Underlined text represents a default value.
vertical bars |	Vertical bars indicate a mutually exclusive choice between items. See braces and brackets, below.
braces { }	Braces indicate a required clause. When a list of items separated by vertical bars is enclosed in braces, you must enter one of the items from the list. Do not enter the braces or vertical bars.
brackets [ ]	Brackets indicate an optional clause. When a list of items separated by vertical bars is enclosed by brackets, you can either select one item from the list or ignore the entire clause. Do not enter the brackets or vertical bars.
ellipsis …	The item preceding an ellipsis may be repeated one or more times. When a clause in braces is followed by an ellipsis, you can use the clause one or more times. When a clause in brackets is followed by an ellipsis, you can use the clause zero or more times.

TOOL Code Conventions

Where this manual includes documentation or examples of TOOL code, the TOOL code conventions in the following table are used.

Format	Description
parentheses ( )	Parentheses are used in TOOL code to enclose a parameter list. Always include the parentheses with the parameter list.
comma ,	Commas are used in TOOL code to separate items in a parameter list. Always include the commas in the parameter list.
colon :	Colons are used in TOOL code to separate a name from a type, or to indicate a Forte name in a SQL statement. Always include the colon in the type declaration or statement.
semicolon ;	Semicolons are used in TOOL code to end a TOOL statement. Always type a semicolon at the end of a statement.

Command Line and Code Examples

Examples of installation script prompts, operating system command lines, and programming code are shown in a monospaced font set off in a shaded area. Here’s an example of a UNIX command line:

```
cd /usr/sbin/slibclean
```

Here’s an example of commands being entered at Forte’s Fscript prompt:

```
fscript> UsePortable
fscript> SetPath %{FORTE_EP_WKDIR}
fscript> Include dmathtm.fsc
```

The Forte Documentation Set

Forte produces a comprehensive documentation set describing the libraries, languages, workshops, and utilities of the Forte Application Environment. The complete Forte Release 3 documentation set consists of the following manuals in addition to comprehensive online Help.

Forte 4GL

- *A Guide to the Forte 4GL Workshops*
- *Accessing Databases*
- *Building International Applications*
- *Escript and System Agent Reference Manual*
- *Forte 4GL Java Interoperability Guide*
- *Forte 4GL Programming Guide*
- *Forte 4GL System Installation Guide*
- *Forte 4GL System Management Guide*
- *Fscript Reference Manual*
- *Getting Started With Forte 4GL*
- *Integrating with External Systems*
- *Programming with System Agents*
- *TOOL Reference Manual*
- *Using Forte 4GL for OS/390*

Forte Express

- *A Guide to Forte Express*
- *Customizing Forte Express Applications*
- *Forte Express Installation Guide*

Forte WebEnterprise and WebEnterprise Designer

- *A Guide to WebEnterprise*
- *Customizing WebEnterprise Designer Applications*
- *Getting Started with WebEnterprise Designer*
- *WebEnterprise Installation Guide*

Forte Example Programs

In this manual, we often include code fragments to illustrate the use of a feature that is being discussed. If a code fragment has been extracted from a Forte example program, the name of the example program is given after the code fragment. If a major topic is illustrated by a Forte example program, reference will be made to the example program in the text.

These Forte example programs come with the Forte product. They are located in subdirectories under $FORTE_ROOT/install/examples. The files containing the examples have a .pex suffix. You can search for TOOL commands or anything of special interest with operating system commands. The .pex files are text files, so it is safe to edit them, though you should only change private copies of the files.

Viewing and Searching PDF Files

You can view and search 4GL PDF files directly from the documentation CD-ROM, store them locally on your computer, or store them on a server for multiuser network access.

Note You need Acrobat Reader 4.0+ to view and print the files. Acrobat Reader with Search is recommended and is available as a free download from http://www.adobe.com. If you do not use Acrobat Reader with Search, you can only view and print files; you cannot search across the collection of files.

To copy the documentation to a client or server:

1. Copy the fortedoc directory and its contents from the CD-ROM to the client or server hard disk.

   You can specify any convenient location for the fortedoc directory; the location is not dependent on the Forte distribution.

2. Set up a directory structure that keeps the fortedoc.pdf and the 4gl directory in the same relative location.

   The directory structure must be preserved to use the Acrobat search feature.

Note To uninstall the documentation, delete the fortedoc directory.

To view and search the documentation:

1. Open the file fortedoc.pdf, located in the fortedoc directory.
2. Click the **Search** button at the bottom of the page or select **Edit > Search > Query**.
3. Enter the word or text string you are looking for in the Find Results Containing Text field of the Adobe Acrobat Search dialog box, and click **Search**.

   A Search Results window displays the documents that contain the desired text. If more than one document from the collection contains the desired text, they are ranked for relevancy.

Note For details on how to expand or limit a search query using wild-card characters and operators, see the Adobe Acrobat Help.

4. Click the document title with the highest relevance (usually the first one in the list or with a solid-filled icon) to display the document.

   All occurrences of the word or phrase on a page are highlighted.

5. Click the buttons on the Acrobat Reader toolbar or use shortcut keys to navigate through the search results, as shown in the following table:

Toolbar Button	Keyboard Command
Next Highlight	Ctrl+]
Previous Highlight	Ctrl+[
Next Document	Ctrl+Shift+]

6. To return to the fortedoc.pdf file, click the Homepage bookmark at the top of the bookmarks list.
7. To revisit the query results, click the **Results** button at the bottom of the fortedoc.pdf home page or select **Edit > Search > Results**.

Chapter 1

Installation Overview

This chapter, "Installation Overview," provides background information that helps you prepare for installing Forte 4GL or Forte 4GL–Runtime Only software. Before beginning your installation, it is recommended that you read this chapter in its entirety. You should also be familiar with information in the *Forte 4GL System Management Guide* that describes how to set up and maintain a Forte system.

This chapter contains the following sections:

- "About Forte 4GL"
- "Platform Matrix"
- "Setting up a Forte 4GL Environment"
- "Preparing for Installation"
- "Installation Media"

Subsequent chapters provide platform-specific instructions for installing Forte 4GL and Forte 4GL–Runtime Only.

About Forte 4GL

Forte 4GL is a software environment for developing, deploying, and managing distributed applications on multiple platforms. It supports the full life cycle of a Forte 4GL application, from development to the management of the application as it runs on a number of platforms.

A Forte 4GL environment includes software that operates at a number of different levels, including a runtime environment for Forte 4GL applications, the development and management of Forte 4GL applications, and management of a Forte 4GL system.

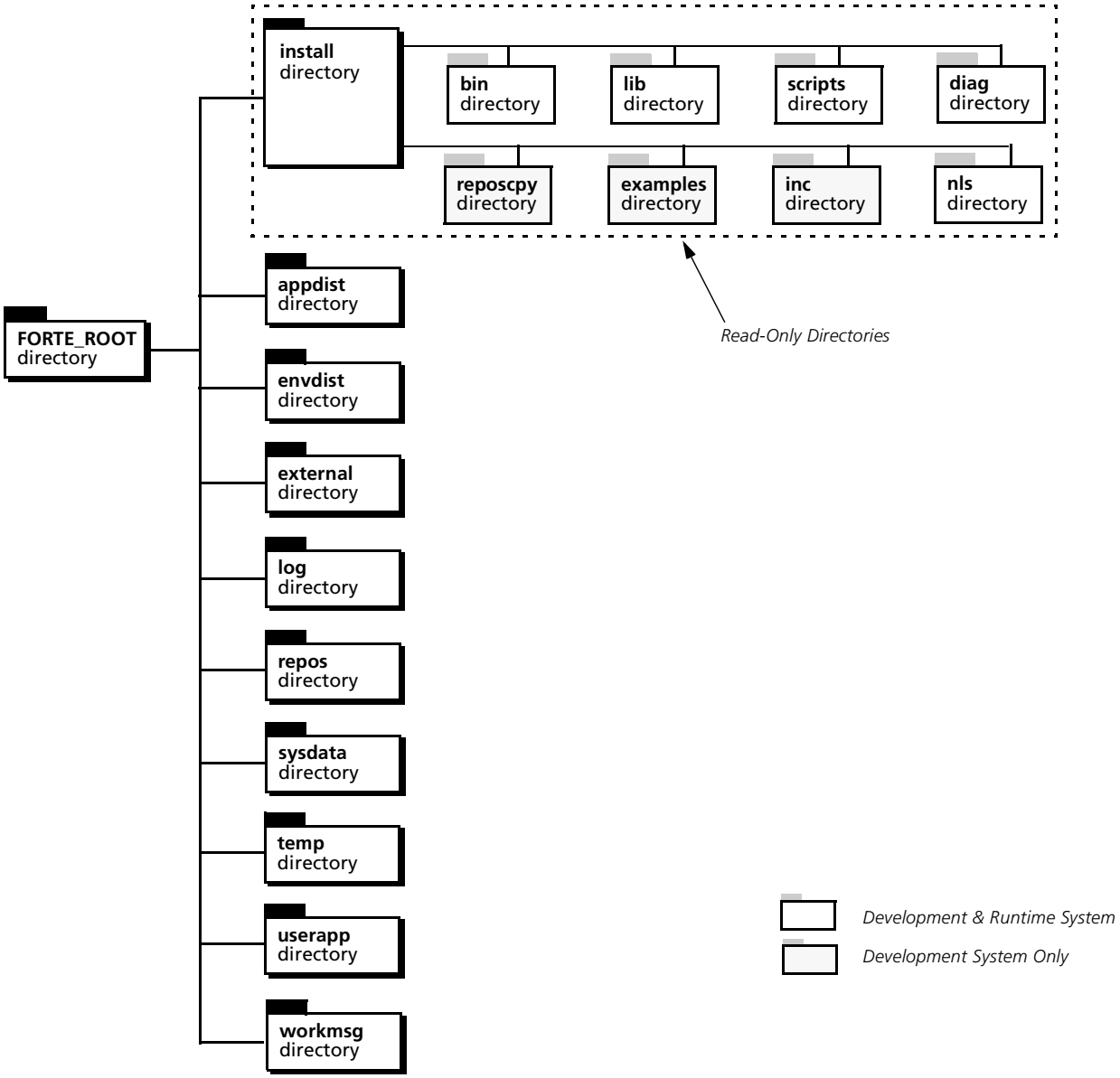
Forte 4GL Software

The distribution on the *Forte 4GL Platform CD* allows you to install a complete package that lets you develop, deploy, run, and manage applications in a Forte environment.

Forte 4GL–Runtime Only Software

The distribution on the *Forte 4GL–Runtime Only CD* allows you to install a smaller set of components that let you deploy, run, and manage Forte runtime client applications. A Forte runtime client can participate in a complete Forte environment and can run Forte applications. However, you cannot develop Forte applications from the software installed from the *Forte 4GL–Runtime Only CD*.

The following figure illustrates the contents of a Forte 4GL installation, calling out the differences for a Forte 4GL–Runtime Only installation. Each platform-specific chapter of this manual contains a description of the contents of the Forte directory structure.



Platform Matrix

The platform matrix, available at http://www.forte.com/support/platforms.html, provides detailed information on platforms certified for each Forte 4GL release. This information includes requirements such as the operating system, database services, and compiler versions supported on each platform as well as which network transport and windowing systems are supported.

Note Platform certification and requirements are subject to change for each release of Forte. Be sure to consult the platform matrix prior to installation.

Setting up a Forte 4GL Environment

A Forte 4GL environment contains the following principal Forte system management services, which can be installed on various nodes in your system:

- Environment Manager

  Governs the Forte environment, supporting Forte communication among the nodes in the environment. The Environment Manager process runs on a central server node. An environment can have only one Environment Manager.

- Node Manager

  Each node in a Forte environment runs a Node Manager process to communicate certain environment-specific information to the Environment Manager.

- Repository service

  The repository service, running on a designated server node (often the environment's central server node), governs use of the Forte repository, which stores development projects and their components.

Forte Nodes

The Forte installation program establishes a node's system management processes during installation. You select one of the following options for the target node:

- central server node

  Hosts the Environment Manager process (and its Forte Name Service), and often the repository server process, as described above. There must be one (and only one) central server node in each Forte environment. In any installation, you should first install the central server node—all other node installations rely upon the identity of the central server node.

- server node

  Hosts a Node Manager process and can provide certain services to other nodes in the environment. A simple server node can participate fully in developing and distributing Forte applications. However, it contains a subset of the software for a central server node. When you install a server node, you are prompted for the Forte Name Service address for the Environment Manager on the central server node.

- client node

  Participates in a Forte environment and can develop Forte applications, but cannot run Forte server node processes. A client node is intended to run only client partitions of Forte applications. A client-only node uses environment services from server nodes. When you install a client node, you are prompted for the Forte Name Service address for the Environment Manager on the central server node.

  On some platforms, you can choose to install a client node as *standalone* (does not participate in a Forte environment).

Forte 4GL–Runtime Only CD

- Forte runtime client node

  A Forte client node that does not contain any project development components. A Forte runtime client node can run Forte applications (exclusive of the Forte workshops), but cannot develop Forte applications. A runtime system node uses less disk storage than a development client node.

  Use the *Forte 4GL–Runtime Only CD* to install a Forte runtime client node.

Preparing for Installation

When installing Forte software, you must be prepared to provide the installer with information about your environment. The information you provide may vary, dependent on the type of node you are installing and the platform of the target node.

Table 1 and Table 2, below, list the types of nodes in a Forte environment, and the information you need to supply the installation program. Each platform-specific chapter in this manual provides additional information on preparing for a Forte installation.

Table 1 *Nodes in a Forte 4GL Environment*

Node	Node Property and Other Information
Central Server	Installation path Port ID for Forte Name Service Environment name Distributed repository name Example applications Database pathnames
Server	Installation path Central server node's Forte Name Service address Database pathnames Distributed repository name Example applications
Client	Installation path Central server node's Forte Name Service address Distributed repository name Example applications

Table 2 *Nodes in a Forte 4GL–Runtime Only Environment*

Node	Node Property and Other Information
Forte Runtime Client	Installation path Forte Name Service address Database pathnames

Installing Forte Software

The following procedure outlines the basic steps for installing Forte software. Details for installation vary, depending on the target platform. For specific installation instructions, refer to the platform-specific chapters in this manual.

To install Forte software in your environment:

1. Verify that all target nodes fulfill requirements outlined in the platform matrix, available from http://www.forte.com/support/platforms.html.
2. Verify that your network is running properly and that the installation files are accessible from your network or from a locally mounted CD.
3. Determine the information you need to provide to perform the installation on the target nodes.

   Platform-specific chapters in this manual provide information on what you need to provide the installation program.
4. Designate a central server node for the Forte environment and install the Forte Application Environment software on that computer.

   The Forte installation program prompts you for the type of node you are installing.
5. Install Forte 4GL or Forte 4GL–Runtime Only software on the remaining nodes that compose your Forte environment.
6. Tune the central server node's environment definition to your environment.

   On the central server node, the Forte installation program builds an environment definition for your environment. As you continue the installation process on other nodes in the environment, each node registers its identity and properties in the environment definition on the central server node. You can modify this definition, as described in the *Forte 4GL System Management Guide*.

Installation Media

Forte 4GL and Forte 4GL–Runtime Only software are provided in CD-ROM format. The CDs conform to the ISO 9660 standard for data, which allows the CDs to be read from a CD-ROM drive on any computer platform.

Note Forte 4GL software for OS/390 is installed from IBM 3490 tape media. For more information on installing Forte 4GL for OS/390, refer to Chapter 6, "Installing Forte and the Forte Transaction Adapter on OS/390."

Forte 4GL Platform CD

The *Forte 4GL Platform CD* includes the Forte system software and installer programs for all supported platforms.

Note The actual platforms supported and the layout of the CD may vary with each release of Forte 4GL.

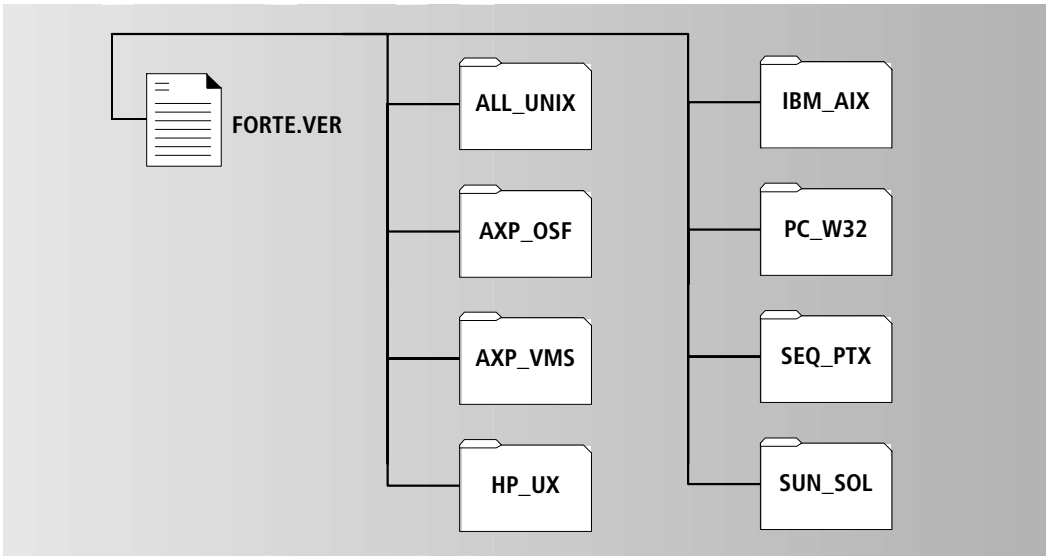


Figure 1 *The Forte 4GL Platform CD Directories*

Forte 4GL–Runtime Only CD

Forte 4GL–Runtime Only software is provided on a single CD and contains installer programs for all supported platforms.

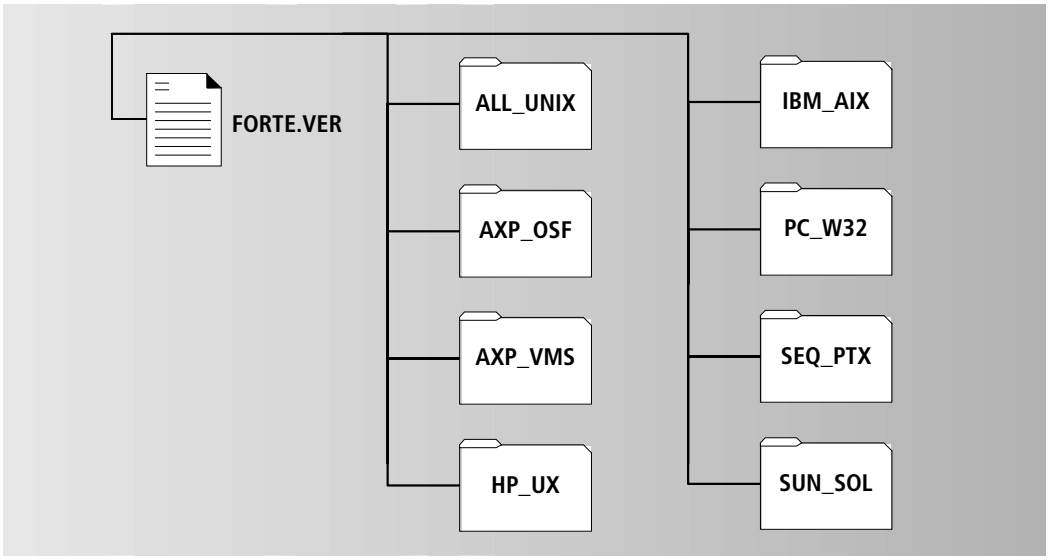


Figure 2 *The Forte 4GL–Runtime Only CD Directories*

Installation Options

There are two basic approaches to installing Forte 4GL on any platform. The approach you take depends on how you access the Forte installation media. You can install Forte onto a target node from either of the following locations:

- a central distribution node
- one of the Forte CDs

Installing from a Central Distribution Node

The easiest way to install Forte is to designate a server with a CD-ROM drive as a central distribution node. Then mount the appropriate Forte CD on the server, making it accessible to your network and any potential installation target nodes. Alternatively, you can copy the necessary files from the CD to a disk on a server that is accessible to the network.

Other nodes in your environment can then access the Forte installation software from the central distribution node. Nodes can use either the network operating system to mount the Forte CD or a network file copy protocol to download the needed directories from the central distribution node.

If you mount the Forte CD from a central distribution node, you can run its installation programs remotely across your network. You can also download the Forte directories to a local directory and run the installation program locally.

Installing from a Local CD-ROM Drive

If your target installation node has its own local CD-ROM drive, you can install the Forte 4GL (or Forte 4GL–Runtime Only) software directly onto the node from the *Forte 4GL Platform CD*. You open the appropriate directory on the CD and run the platform-specific installation program for the target node.

Chapter 2

Installing Forte on a UNIX Node

This chapter describes how to install Forte 4GL software and Forte 4GL–Runtime Only software on any supported UNIX platform. This chapter also discusses configuring a UNIX node once you complete installation.

Forte 4GL software is installed from the *Forte 4GL Platform CD*. Forte 4GL–Runtime Only software is installed from the *Forte 4GL–Runtime Only CD*. For information on Forte 4GL and Forte 4GL–Runtime Only software, and on the Forte CDs, refer to "Installation Media" on page 19.

The installation procedure is the same for all supported UNIX platforms, however the system requirements may differ for each platform. Refer to the platform matrix at http://www.forte.com/support/platforms.html for the requirements for this release.

The chapter contains the following sections:

- "Preparing for a Forte Installation"
- "Installing the Software"
- "After Installing Forte"
- "Testing Your Installation"

Preparing for a Forte Installation

Before beginning a Forte installation, you should read Chapter 1, "Installation Overview" on page 13. Chapter 1 provides background information on Forte that is helpful to planning and installing Forte 4GL and Forte 4GL–Runtime Only software. You should also be familiar with information in the *Forte 4GL System Management Guide* that describes how to set up and maintain a Forte system.

Platform Matrix

Forte has critical dependencies on operating systems, windowing systems, networking systems, runtime libraries, and database management systems. Before installing Forte system software, consult the platform matrix (at http://www.forte.com/support/platforms.html) to make sure the target platform meets the requirements for this release.

Your system must meet the minimal requirements for the following components:

Component	Comments
Operating system	The version of the UNIX operating systems supported for this release.
Windowing system	For UNIX platforms, the type and version of the windowing system.
Networking system	Nodes with distributed installations must be able to ping server nodes.
C++ compiler	Required if you intend to integrate 3GL programs with Forte applications or create compiled partitions and libraries.
Database systems	Required if you plan to access databases through Forte. The database environment variable for supported databases must refer to a valid database installation before you install Forte. Additionally, the environment variable providing access must be defined according to the database vendor's instructions. For more information on database access, refer to "Understanding the fortedef Script" on page 31.
External interface	Required if you plan distributed access using third party tools.

User Accounts and Privileges

The Forte installation is not dependent on user status. You can install Forte software using any UNIX account and with any privileges. However, your account must have permission to write to the /tmp directory. The installation script establishes UNIX group permissions for using Forte based on the login you use when you begin installation.

Caution Under all UNIX operating systems (except Compaq Tru64 UNIX), do not log in as root to install Forte software. If you log in as root to install Forte, the resulting installation is accessible only to the root account.

Compaq Tru64 UNIX

If you are installing Forte on a Compaq computer under Compaq Tru64 UNIX running C-2 security, *you must install Forte using the root account*. If you are not running C-2 security, you should not install Forte using the root account.

Types of Installations

"Setting up a Forte 4GL Environment" on page 16 discusses the types of nodes in a Forte environment. During installation, you select the type of node you are installing and provide information during the installation process.

The following tables list the types of nodes in a Forte environment, and the information you need to supply the installation program. "Forte Environment" on page 24 provides descriptions of the information listed in these tables.

For complete information about setting up a Forte environment, refer to the *Forte 4GL System Management Guide*.

Table 3 *Nodes in a Forte 4GL Environment*

Node	Node Property and Other Information
Central Server	Installation path Port ID for Forte Name Service Environment name Distributed repository name Example applications Database pathnames
Server	Installation path Central server node's Forte Name Service address Database pathnames Distributed repository name Example applications
Client	Installation path Central server node's Forte Name Service address Distributed repository name Example applications

Table 4 *Nodes in a Forte 4GL–Runtime Only Environment*

Node	Node Property and Other Information
Forte Runtime Client	Installation path Forte Name Service address Database pathnames

Forte Environment

The following table provides details on the information you need to provide during the installation process for Forte 4GL or Forte–Runtime Only. For information on the types of nodes you can install, refer to "Types of Installations" on page 23.

Information/Nodes	Description	Default Value
Installation path *all nodes*	Location of the Forte directory structure. This location becomes the value of the FORTE_ROOT environment variable.	/forte
Port ID for Forte Name Service *central server*	A unique port ID on the central server node specifying the Name Service Address. The port ID must be a number between 1025 and 9000 inclusive. The Name Service Address identifies the node in the context of its Forte environment, and must therefore be a unique identity within the environment at any time. The address consists of the network name of the central server node and the specified port ID, separated by a colon (for example, *myserver*:5000). This is the value specified by the node's FORTE_NS_ADDRESS environment variable, which the installation program sets using the value you provide. When installing the central server node, specify only the port ID.	5000
Forte Name Service Address *server* *client only* *runtime client*	The address a server node uses to connect to the name service for the Forte environment. The name service is a Forte process running on the Forte environment's central server node, governing Forte communication among nodes in the environment. The address itself consists of the network name of the central server node and the specified port ID, separated by a colon (for example, *myserver*:5000). The port ID is specified during the installation of the central server node. The installation program uses the value specified for the Forte Name Service Address to set the FORTE_NS_ADDRESS environment variable. You should be able to ping the server by name if the name is part of the name service address, or by the IP address if the IP address is part of the name service address.	none
Database pathnames *central server* *server* *runtime client*	The pathname for the root of the supported database installation. If Oracle is installed on the node, you must also specify the Oracle server (ORACLE_SID).	*Do not specify a path to a database*
Environment name *central server*	A name used in managing the environment. If you plan to connect environments, each environment name should be unique to simplify specification in search paths.	CentralEnv
Distributed repository name *central server* *server* *client only*	The name of the central development repository a node uses in its Forte environment for collaborative application development.	CentralRepository
Example applications *central server* *server* *client only*	Several Forte example programs that illustrate how to use TOOL and the Forte classes. Examples are installed in the $FORTE_ROOT/install directory and consist of .pex (Forte project export) files and other related data files. For more information on the example programs, refer to the manual, *A Guide to the Forte 4GL Workshops*.	*install examples*

Installing the Software

This section describes the installation procedures to install Forte 4GL and Forte 4GL–Runtime Only software. The installation script is available from the ALL_UNIX directory of the distribution CD. The script uses the files in the ALL_UNIX directory, together with files in the directory corresponding to your UNIX platform, to assemble a Forte installation on your node. (Depending upon your platform, the command and directory names may be in upper or lower case.)

For information on the differences between the Forte 4GL and Forte 4GL–Runtime Only, refer to "About Forte 4GL" on page 14.

Before you begin the installation procedure, you must first mount the distribution CD, as described in the following section. For information on accessing the Forte CDs, refer to "Installation Media" on page 19.

Mounting the Distribution CD

Before mounting a Forte distribution CD on a UNIX system, an empty directory for mounting the CD must already exist. The following table lists the mount commands for various UNIX platforms. (Consult the platform matrix at http://www.forte.com/support/platforms.html for platforms supported for this release).

Platform	Mount command syntax
Solaris	**mount -r -F hsfs** /dev/dsk/*devicename* */cdrom*
HP/UX	**mount -r -t cdfs** /dev/dsk/*devicename* */cdrom*
IBM AIX	**mount -r -v cdrfs** /dev/*devicename* */cdrom*
Compaq Tru64 UNIX, Alpha	**mount -r -t cdfs** /dev/*devicename* */cdrom* (A cdfs Kernel option entry is required for this command to work.)
Siemens/Nixdorf	**mount -r -F cdfs** /dev/ios_name/*devicename* */cdrom* (A cdfs Kernel option entry is required for this command to work)
Sequent	**mount -r -F cdfs** /dev/dsk/*devicename* */cdrom*

In the above examples for the mount command:

-r specifies that the file system is mounted read only.

-t arg (also *-F arg* and *-v arg*, depending on the OS) specifies the type of file system for mounting the CD.

devicename is a designated device on your system.

cdrom is an existing empty directory representing the mount point for the Conductor CD.

If you are installing from a server on your network, you need access to the ALL_UNIX directory and to the installation directory corresponding to your UNIX platform.

The following table lists the directories required for each UNIX platform:

Platform	Installation Directories
Compaq Tru64 UNIX, Alpha	/ALL_UNIX and /AXP_OSF
Solaris	/ALL_UNIX and /SUN_SOL
HP 9000	/ALL_UNIX and /HP_UX
RS 6000	/ALL_UNIX and /IBM_AIX
Sequent	/ALL_UNIX and /SEQ_PTX

Note The actual platforms supported, and the directories available on the Forte CDs may vary with each release.

Installing Forte 4GL

The following procedure describes how to install Forte 4GL software on a UNIX node. If you are installing Forte 4GL–Runtime Only software, refer to "Installing Forte 4GL–Runtime Only" on page 27.

To accept any default values during the installation process, press the **Enter** or **Return** key.

To install Forte 4GL software on a UNIX node:

1. Set your current directory to the source of the installation files.

   If you are installing across a network, mount the Forte installation directories containing the ALL_UNIX directory and the UNIX directory specific to your platform.

   If you are installing from the *Forte 4GL Platform CD*, mount the CD as explained in "Mounting the Distribution CD" on page 25.

2. Execute the INSTALL.SH program, located in the ALL_UNIX subdirectory of the *Forte 4GL Platform CD* or in the designated directory of your server node, by typing:

   ```
   ./INSTALL.SH
   ```

3. The installer prompts you for a target directory for your Forte installation.

   ```
   Specify the Forte installation path (default is /forte):
   ```

   If the target directory you specify does not exist, the installer creates it for you.

4. When installing Forte 4GL, the installer provides you with the following options:

   ```
                  Forte Installation Menu
                  ----- ------------ ----

      1 - Install & Setup for Central Server Node
      2 - Install & Setup for Server Node
      3 - Install & Setup for Client Only
      4 - Install Files Only
      q - Exit Installation Program

      Select Option [1, 2, 3, 4, q (default is 4)]:
   ```

   Refer to "Types of Installations" on page 23 for a description of the installation options.

5 After selecting an installation option, the installer prompts you for additional information.

Refer to "Forte Environment" on page 24 for a description of the information you need to provide for each option.

6 Confirm your installation options.

For example:

```
CONFIRMATION:
-------------
Installation Option: Forte Development Install & Setup for Central
Server Node.

. . .

Do you wish to continue the installation with these options? (y/n,
default is y)
```

To confirm your selections, and continue with the installation, specify 'y'.

To change a selection, specify 'n' to abort the installation. Then start the installation script again.

After you confirm your choices, the installation proceeds to completion.

Note The installation aborts if the target disk is not mounted or if there is not enough free disk space for the installation to complete.

After the installation is complete, proceed to "After Installing Forte" on page 29.

Installing Forte 4GL–Runtime Only

The following procedure describes how to install Forte 4GL–Runtime Only software on a UNIX node. During the installation process, to accept any default values, press the **Enter** or **Return** key.

▶ **To install Forte 4GL–Runtime Only on a UNIX node:**

1 Set your current directory to the source of the installation files.

If you are installing across a network, mount the Forte installation directories containing the ALL_UNIX directory and the UNIX directory specific to your platform.

If you are installing from the *Forte 4GL–Runtime Only CD*, mount the CD as explained in the previous section, "Mounting the Distribution CD" on page 25.

2 Execute the INSTALL.SH program, located in the ALL_UNIX subdirectory of the Forte CD or in the designated directory of your server node, by typing:

```
./INSTALL.SH
```

3 The installer prompts you for a target directory for your Forte installation.

```
Specify the Forte installation path (default is /forte):
```

If the target directory you specify does not exist, the installer creates it for you.

4 When installing Forte 4GL–Runtime Only software, the installer provides you with the following options:

```
                Forte Runtime Installation
                --------------------------

    Install & Setup for the Forte Runtime System
    Q - Exit Installation Program

    Press <Enter> to Continue or Q to Exit:
```

5 Press **Enter** or **Return** to continue with the installation.

The installer prompts you for additional information. Refer to "Forte Environment" on page 24 for a description of the information you need to provide for each option.

6 Confirm your installation options.

For example:

```
CONFIRMATION:
-------------
Installation Option: Install of a Forte Runtime System.

. . .

Do you wish to continue the installation with these options? (y/n,
default is y)
```

If you want to change a selection, specify 'n' to abort the installation, and then start the installation script again.

After you confirm your choices, the installation proceeds to completion.

Note The installation aborts if the target disk is not mounted or if there is not enough free disk space for the installation to complete.

After the installation is complete, proceed to "After Installing Forte" on page 29.

After Installing Forte

Your Forte installation on UNIX platforms contains the following components:

- FORTE_ROOT directory structure

  FORTE_ROOT is the directory you define as the target directory for your Forte installation. For information on this directory structure, refer to "FORTE_ROOT Directory Structure" on page 29.

- fortedef script

  The fortedef script is a shell script that defines the Forte configuration for your node in a series of environment variables. The installation script initially sets these values according to the information you provide.

  For more information on the fortedef script, refer to "Understanding the fortedef Script" on page 31.

- forteboot script

  The forteboot script is a shell script that you use to start Forte. The script contains commands to start Forte components according to a configuration you define. Initially, forteboot uses the default configuration defined by the fortedef script.

  For more information on the forteboot script, refer to "Understanding the forteboot Script" on page 33.

Forte 4GL–Runtime Only

The forteboot script is not created for Forte 4GL–Runtime Only installations.

Before starting Forte, you must set the FORTE_FTLAUNCH_PORT environment variable, as described in "Setting the FORTE_FTLAUNCH_PORT Environment Variable" on page 34. Also, you may have to manually provide access to some databases, as described in "Linking Forte with Informix and Sybase" on page 34.

FORTE_ROOT Directory Structure

FORTE_ROOT is the directory you define as the target directory for your Forte installation. The installation script sets the location of your FORTE_ROOT directory as the value of the FORTE_ROOT environment variable.

Caution Do not change the structure of the FORTE_ROOT directory. The directory structure must remain intact for Forte to function properly—Forte relies on the path links within the structure to locate and use Forte components.

The installation script installs the FORTE_ROOT structure at the location you choose. You can later move the location of FORTE_ROOT, but you must keep the structure intact. If you move the location of FORTE_ROOT, then you should change any Forte environment variable that defines the location of files and directories in the structure.

The following table describes the contents of the directory structure defined by FORTE_ROOT:

Directory	Description
appdist	Location for all application and library distribution files created when you make a distribution. Also, user-developed distributions can be placed here from a CD-ROM or other media so they can be deployed in a Forte environment. The Forte installer also places Forte system application distributions in this directory to be deployed when you install Forte system software. Refer to the *Forte 4GL System Management Guide* for more information.
envdist	Exported environment definitions. This directory is empty at installation. For more information about creating and using environment definitions see the *Forte 4GL System Management Guide*.
external	This directory is empty at installation.
install	Files and subdirectories for executing the Forte development system. For a detailed description of the contents of the install subdirectory, see the table below.
log	Forte log files. For information about configuring the Forte logging facilities, see the *Forte 4GL System Management Guide*.
repos	Forte user repositories (including the example programs repository, demo30) created on demand at installation.
sysdata	Contains the environment repository and other information important to the Forte runtime system and Forte system management.
tmp	Files that the Forte system creates for its own use while Forte is running.
userapp	Location for all applications (Forte partitions) and libraries installed on this node. Only application partitions that run on a particular node are installed in the userapp directory of that node. Partitions are installed by Forte system management services during the application deployment process, and can include both user-developed application partitions and Forte system application partitions. Refer to the *Forte 4GL System Management Guide* for more information.
workmsg	Compiled message catalogs that you create for the purpose of internationalizing your Forte applications. For more information about creating compiled message catalogs, and internationalizing your Forte applications, see *Forte 4GL Programming Guide*. This directory is empty at installation.

Install Directory

The FORTE_ROOT/install directory contains much of what the Forte system uses to run itself, including:

- executable programs
- Forte dynamically linked libraries
- B-tree seed repositories
- example programs (if installed)
- scripts
- diagnostic tools

The following table describes the contents of the FORTE_ROOT/install directory:

Directory	Description
bin	The Forte executables, shared libraries, and a set of Forte batch files.
	The Forte executables run Forte support processes, system-level applications, some of which, such as ftcmd and ftexec, run Forte image repositories (interpreted applications built in Forte).
	The Forte shared libraries are the compiled code extensions to the Forte system.
	The Forte batch files perform autonomous work using various Forte applications, such as rpclean, Escript, and Fscript. For more information about using and configuring the batch files in this directory, see the *Forte 4GL System Management Guide*.
diag	The Forte diagnostic tools, for use in consultation with Forte Technical Support specialists to diagnose Forte system problems. These tools use the Forte debugging files in the FORTE_ROOT/install/bin directory, described above.
examples	A series of subdirectories containing the Forte example programs, which themselves consist of .pex (Forte project export) and related data files.
inc	A series of directories containing header and class definition files that define the Forte runtime. For example, the ds directory contains files that define the Forte widgets.
lib	3GL libraries for inclusion in Forte applications that you build.
nls	Subdirectories containing native language services files, which are used in building international Forte applications. For information on building international applications, see *Forte 4GL Programming Guide*.
reposcpy	The seed, or template, for a b-tree repository, and the node's system repository.
	The seed repository, btseed, consists, like any b-tree format repository, of two files: btseed.btd and btseed.btx. When you create a new repository, the Forte system bases the new repository on this btseed template repository.
	The system repository, consisting of the system.btd and system.btx files, contains the Forte object definitions.
scripts	Forte scripts, some of which the INSTALL.SH program uses in installing Forte on your node, and others which you can use or adapt to automate Forte tasks, such as starting and stopping Forte and Forte components.

Understanding the fortedef Script

The fortedef shell script defines the Forte configuration for your node in a series of environment variables, according to the information you pass to it at installation time. It also defines the appropriate shared library path for your UNIX platform.

For a listing of the Forte environment variables created during installation, refer to "Forte Environment Variables" on page 32. For more information about setting Forte environment variables, refer to *A Guide to the Forte 4GL Workshops*.

The fortedef script comes in two forms, one for the Bourne shell, and one for the C shell:

Bourne Shell $FORTE_ROOT/fortedef.sh

C Shell $FORTE_ROOT/fortedef.csh

Creating and Using fortedef Scripts

You can use the fortedef script as a template for creating other fortedef scripts for other Forte configurations, or for other users. To use your own fortedef scripts, you can either source them manually before starting Forte, or reference them in your .login file.

You can also include a fortedef script in your .login file or in your .shrc or .cshrc file. (For HPUX, use .profile rather than .shrc.)

Forte Environment Variables

The following table lists the environment variables created or amended by the Forte installer for UNIX installations.

Environment Variable	Definition	Default Value
FORTE_LOGGER_SETUP	A string defining how Forte keeps logs of your use of Forte. You can use the Forte logging facility to track many kinds of Forte processes, and to isolate problems in Forte itself and in Forte applications that you develop. When you start Forte, the runtime system consults this key to determine what logging processes to implement. For more information on how to use Forte log files and the Forte logging facilities, see the *Forte 4GL System Management Guide*.	%stdout(err:sh:*)
FORTE_NS_ADDRESS	The Forte name service address for your node. The address of the name service for the Forte environment to which you are connecting your node. The name service is a Forte process running on the Forte environment's central server node, governing Forte communication among nodes in the environment. The address itself consists of two parts, separated by a colon, as in *myserver:5000*, the default value. The first part of the address is the network name of the central server node, and the second part is a number between 1025 and 9000, inclusive.	*myserver*:5000
FORTE_REPOSNAME	The name of central development repositories.	CentralRepository
FORTE_ROOT	The FORTE_ROOT directory contains your Forte installation: the executables and data files that compose the Forte system. For more information about the contents of the FORTE_ROOT directory structure, see "FORTE_ROOT Directory Structure" on page 29.	/forte
PATH	Updated to include the path to your Forte executables and shared libraries located in subdirectories of the FORTE_ROOT directory.	The path to the file in your FORTE_ROOT directory: FORTE_ROOT/install/bin
Database Variables	The location of a valid database installation. Actual variables depend upon the database system. An example of the variable for an Oracle database would be ORACLE_HOME=*path*. For the list of database variables see *Accessing Databases*.	Determined at installation.
Library Path Variables For example: LD_LIBRARY_PATH LIBPATH SHLIB_PATH	Updated to include the path to database libraries. You can modify the library path environment variable to include the library directory for databases you have added after the initial Forte installation. The library path environment variable must be set on the server where the database resides before you start the Forte Node Manager or Forte executable. Library path settings are platform specific. For more information see *Accessing Databases*.	Automatically set at installation.

Understanding the forteboot Script

The installation script creates the forteboot script that you can use to start Forte or any of its components. The script contains commands to start Forte server processes.

Note The forteboot script is not created for Forte 4GL–Runtime Only installations.

The forteboot script starts Forte system management processes according to the setup options selected during installation. For example, if you selected the central server setup option, the forteboot script starts an environment manager process and repository server process.

The forteboot script comes in two forms, one for the Bourne shell, and one for the C shell:

Bourne Shell $FORTE_ROOT/forteboot.sh

C Shell $FORTE_ROOT/forteboot.csh

In its default configuration, the script sources the fortedef script to set your Forte environment variables before starting Forte, and defines command lines for starting Forte development applications.

Creating and Using forteboot Scripts

You can modify the forteboot script to add whatever shell-based logic you like, such as prompts for using different fortedef files, or different command lines for starting various Forte applications. You can also use the forteboot script as a template to make other forteboot scripts.

Include the forteboot script in your rc.local file

You can include the forteboot script in your rc.local file (or, for HPUX, your .brc file in /etc).

You should place the forteboot command at the end of your startup file, after the startup of TCP/IP. Because of the time it takes to start Forte server processes, this portion of the startup can take a noticeable length of time.

The following table defines the commands embedded in the forteboot.csh script. The forteboot.sh script contains identical functionality using Bourne shell syntax.

Command	Purpose
source fortedef.csh	Sets variables as defined in fortedef file.
$FORTE_ROOT/install/bin/start_nodemgr -e *environment name*	Starts the environment manager process for the environment.
$FORTE_ROOT/install/bin/rpstart -fr bt: -n *repository name*	Starts the Repository Service for the environment.

Setting the FORTE_FTLAUNCH_PORT Environment Variable

Before using your Forte installation, you must set your FORTE_FTLAUNCH_PORT environment variable. This variable sets the socket at which the Forte Launch Server listens to receive commands from the Ftcmd utility. You need a different socket for each instance of the Forte Launch Server running on your machine. This means that, on a given machine, each Forte user running an instance of the Forte Launch Server must use a unique value for the FORTE_FTLAUNCH_PORT environment variable.

You can set the FORTE_FTLAUNCH_PORT variable manually whenever you use Forte, as described in the procedure below, or you can set it in your user-specific shell scripts that control your UNIX environment. However, do *not* set this variable in your fortedef file.

To set the FORTE_FTLAUNCH_PORT environment variable:

1 At a UNIX prompt, issue the following command:

```
% setenv FORTE_FTLAUNCH_PORT=unique port number
```

You can use any valid port number (from 1025 to 65536, inclusive) for your machine as a port number.

Linking Forte with Informix and Sybase

Normally, the installation script links Forte executables to the databases of your choice at installation.

Because of the way Sybase and Informix have implemented ports to certain UNIX platforms, in some cases you may need to link Forte to one or both of these products manually. You need to manually link Sybase or Informix under the following circumstances:

- On any UNIX platform, if you install Sybase after you install Forte
- On the HP 9000 platform, if you install Informix after you install Forte

Linking Forte with Sybase

Use the Forte script, linksyb, to manually link Forte to a Sybase database.

Before running the linksyb script, terminate any Forte server partitions you may have running. This includes the Forte environment manager, node manager, and repository server.

To execute the linksyb script:

1. Change directories to FORTE_ROOT/install/bin directory as follows:

```
% cd $FORTE_ROOT/install/bin
```

2. Invoke the script by typing:

```
% ./linksyb
```

HP 9000 only

If you are using the HP 9000 platform and need to link Forte to both Sybase and Informix, the linksyb script can create both links.

Linking Forte with Informix on HP 9000

The installation script links Informix libraries into the Forte ftexec executable. However, on the HP 9000 platform, if you install Informix after you have installed Forte, you must perform this linking yourself using the linkix utility provided by Forte. Some additional disk space is required to support this link.

Before running the linkix utility, terminate any Forte server partitions you may have running. This includes the Forte environment manager, node manager, and repository server.

To execute the linkix script:

1. Change directories to FORTE_ROOT/install/bin directory as follows:

```
% cd $FORTE_ROOT/install/bin
```

2. Invoke the script:

```
% ./linkix
```

Note

On the HP 9000 platform, if you need to link Forte to both Sybase and Informix, the linksyb script (described in "Linking Forte with Sybase" on page 35) can create both links.

Testing Your Installation

You can test your installation by running Forte in distributed mode.

To run Forte in distributed mode:

1. Source the forteboot script to start the central server node processes.

   This starts your development environment. For more information on setting up a Forte development environment, see the *Forte 4GL System Management Guide*.

2. Use the forte command to start the Forte Repository Workshop.

   ```
   % forte
   ```

   The forte command uses the central development repository you specified during installation.

If you installed the Forte example applications, you can run them from the Repository Workshop.

To run the Forte examples from the demo30 repository:

1. Issue the following command to start Forte in standalone mode, connecting to the demo30 repository.

   ```
   % forte -fs -fr bt:$FORTE_ROOT/repos/demo30
   ```

For information about Forte command syntax and command flags, refer to *A Guide to the Forte 4GL Workshops*.

Chapter 3

Installing Forte on Windows NT and Windows 2000 Nodes

This chapter describes how to install Forte 4GL software and Forte 4GL–Runtime Only software on Windows NT and Windows 2000 platforms. This chapter also discusses configuring a Windows node once you complete installation.

For information on installing Forte on Windows 95/98 for development and deployment of Forte applications, refer to Chapter 4, “Installing Forte on Windows 98/95 Nodes” on page 59

Forte 4GL software is installed from the *Forte 4GL Platform CD*. Forte 4GL–Runtime Only software is installed from the *Forte 4GL–Runtime Only CD*. For information on Forte 4GL and Forte 4GL–Runtime Only software, and on the Forte CDs, refer to “Installation Media” on page 19.

The installation procedures are similar for all supported Windows platforms, however the system requirements may differ for each platform. Refer to the platform matrix at http://www.forte.com/support/platforms.html for the requirements for this release.

This chapter contains the following sections:

- “Preparing for a Forte Installation” on page 38
- “Installing the Software” on page 41
- “After Installing Forte 4GL” on page 52

Preparing for a Forte Installation

Before beginning a Forte installation, you should read Chapter 1, “Installation Overview” on page 13. Chapter 1 provides background information on Forte that is helpful to planning and installing Forte 4GL and Forte 4GL–Runtime Only software. You should also be familiar with information in the *Forte 4GL System Management Guide* that describes how to set up and maintain a Forte system.

Platform Matrix

Forte has critical dependencies on operating systems, windowing systems, networking systems, runtime libraries, and database management systems. Before installing Forte system software, consult the platform matrix (at http://www.forte.com/support/platforms.html) to make sure the target platform meets the requirements for this release.

Your system must meet the minimal requirements for the following components:

Component	Comments
Operating system	The versions of Microsoft Windows supported.
Windowing system	For Microsoft platforms, this is the native windowing system.
Networking system	Nodes with distributed installations must be able to ping server nodes.
C++ compiler	Required if you intend to integrate 3GL programs with Forte applications or create compiled partitions and libraries.
Database systems	Required if you plan to access databases through Forte. The database environment variable and/or registry keys for supported databases must refer to a valid database installation before you install Forte. Additionally, the environment variables and registry keys providing access must be defined according to the database vendor’s instructions.
External interface	Required if you plan distributed access using third party tools.

User Accounts

The setup program establishes access to Forte according to the user account you use when you perform the installation. For Windows NT, you can install Forte with Administrator privileges, or you can install under a user account without Administrator privileges. For Windows 2000, you must have Administrator privileges to install Forte system software.

Administrator Privileges

Installing Forte with Windows NT Administrator privileges provides maximum flexibility, allowing you to:

- establish Forte environment services as Windows NT services
- configure Forte for accessibility by all node users

  The setup program automatically enters Forte configuration information into the Windows NT registry’s HKEY_LOCAL_MACHINE hive, and creates universally accessible shortcuts to Forte utilities and components.

User Account without Administrator Privileges

If you install under a user account without Administrator privileges, the setup program configures Forte for operation strictly under the user account, entering Forte configuration information in the Windows NT registry's HKEY_CURRENT_USER hive, and establishes Forte shortcuts visible only to that account. This means that when other users log in to the node under different user accounts, they lack the necessary registry settings and shortcuts to use Forte.

Types of Installations

"Setting up a Forte 4GL Environment" on page 16 discusses the types of nodes in a Forte environment. During installation, you select the type of node you are installing and provide information during the installation process.

The following tables list the types of nodes in a Forte environment, and the information you need to supply the installation program. "Forte Environment" on page 40 provides descriptions of the information listed in these tables.

For complete information about setting up a Forte environment, refer to the *Forte 4GL System Management Guide*.

Table 5 *Nodes in a Forte 4GL Environment*

Node	Node Property and Other Information
Central Server	Target directory Forte Name Service address Environment name Distributed repository name Example applications
Server	Target directory Forte Name Service address Distributed repository name Example applications
Client (Distributed)	Target directory Forte Name Service address Distributed repository name Example applications
Client (Standalone)	Target directory Example applications
Forte files	This option copies only the Forte directory structure and source files to the target node, leaving the node setup for later.

Table 6 *Nodes in a Forte 4GL–Runtime Only Environment*

Node	Node Property and Other Information
Forte Runtime Client	Target directory Forte Name Service address

Forte Environment

During the installation process, the setup program prompts you for information about your Forte environment. Using the information you provide, setup creates Forte keys in the system registry (also known as Forte environment variables). The information you provide the setup program depends on the type of Forte node you are installing. The following table describes the information you need to provide the installer.

Table 7 *Forte Environment Setup*

Information/Nodes	Description	Default Value
Target directory *all nodes*	The root directory of your Forte installation. The setup program creates the FORTE_ROOT environment variable based on this location.	C:\forte
Communications Provider *all nodes* *(except standalone)*	The communications interface the Windows client uses to run Forte. On Windows NT, Forte supports the Windows Sockets interface exclusively, so you do not need to change the default.	Windows Sockets
Name Service Address *server* *client (distributed)* *runtime client*	The address of the name service for the Forte environment you are establishing. The name service is a Forte process running on the central server node you are installing. The name service governs Forte communication among nodes in the environment. The address consists of the network name of the central server node and the specified port ID, separated by a colon (for example, *myserver*:5000). The port ID must be a number between 1025 and 9000 inclusive. You should be able to ping the server by name if the name is part of the name service address, or by the IP address if the IP address is part of the name service address. The setup program inserts the value you specify into your Windows registry as the value of the FORTE_NS_ADDRESS key in either the HKEY_LOCAL_MACHINE hive (installing with Administrator privileges) or the HKEY_CURRENT_USER hive (installing with User privileges). You can later change this value to connect your node to a different environment by changing the environment variable yourself. For a full description of the changes the setup program makes to your Registry, see "Forte Registry Keys" on page 55.	*myserver*:5000
Central repository name *central server* *server* *client (distributed)*	The name of the central development repository the node maintains in its Forte environment for collaborative application development.	CentralRepository
Environment name *central server*	A name used for managing the environment. If you plan to connect environments, each environment name should be unique to simplify specification in search paths.	CentralEnv

Installing the Software

This section describes the installation procedures to install Forte 4GL and Forte 4GL–Runtime Only software. The installation setup program is available from the distribution CD.

For information on the differences between the Forte 4GL and Forte 4GL–Runtime Only, refer to "About Forte 4GL" on page 14.

For information on accessing the Forte CDs, and the location of the setup program, refer to "Installation Media" on page 19.

Note You cannot install onto a remote disk—the target disk must be directly attached to the target node for both client and server installations.

The process for installing Forte 4GL and Forte 4GL–Runtime Only software is the same for all supported Windows platforms. Use the setup program to install Forte or any of its components, upgrade previous Forte installations, or uninstall Forte or any of its components.

Installing Forte Application Environment

Use the setup program on the *Forte 4GL Platform CD* to install the Forte 4GL software. If you are installing Forte 4GL–Runtime Only software, refer to "Installing Forte 4GL–Runtime Only" on page 49.

The setup program offers you the following installation options.

Option	Description
Full Distributed Installation	Installs Forte and configures the target node as the central server node for a Forte environment, establishing Forte environment variable settings in the Windows NT registry for this purpose. A full distributed installation automatically installs all of the optional components available from a custom installation.
Custom Installation	Allows you to select from the following installation types: ▮ central server node ▮ server node ▮ client only (distributed) ▮ client only (stand alone) ▮ install Forte files only Also, provides options for installing any or all of these Forte components: ▮ Forte Development System (the Forte system software) ▮ Forte Examples (Forte Example Programs) ▮ Forte NT Services ▮ Forte Diagnostic Tools (tools for evaluating problems in your Forte environment with help from the Forte technical support team.) ▮ Forte Debug Files (files for evaluating problems in your Forte environment with help from the Forte technical support team.)
Uninstall Forte	Uninstalls Forte by removing all Forte files from specified location.

The following sections provide installation procedures for the following types of Forte Application Environment installations:

- "Full Distributed Installation" on page 42
- "Custom Installation" on page 44

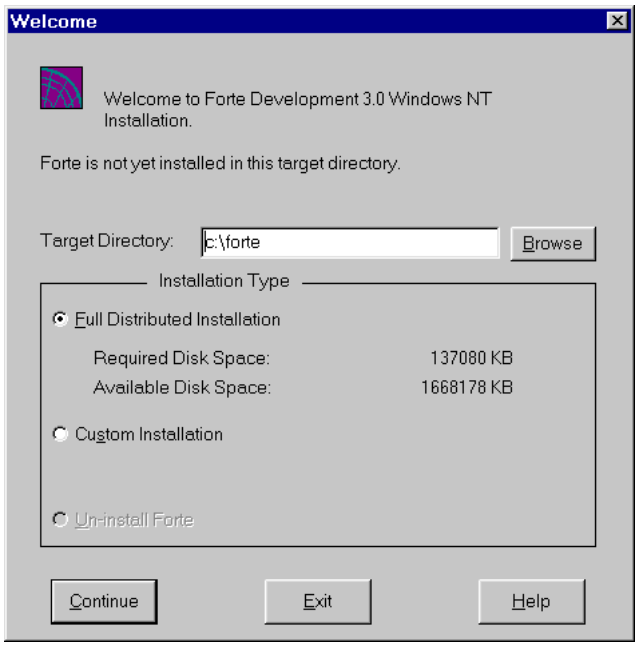
Full Distributed Installation

This section describes how to perform a full distributed Forte installation—the Forte setup program installs and configures a full Forte development system for a central server node in a Forte environment.

To perform a standard, full distributed Forte 4GL installation:

1 From the *Forte 4GL Platform CD*, start the setup program (available in the PC_W32 folder).

After displaying the splash screen, the setup program displays the Welcome dialog.



Note You can exit the setup program at any time by clicking **Exit**. However, exiting the installation before its completion may leave changes made by the installer in the Windows registry and Forte files on your local disk. Run the setup program's uninstall option to clean up the registry and to remove any installed Forte files.

2 Specify a target directory for the Forte installation

If the target directory you specify does not exist, the setup program creates it for you. The setup program creates the FORTE_ROOT environment variable based on your specification.

3 Select Full Distributed Installation option and click **Continue**.

The setup program displays the Distributed Setup dialog, which prompts you for information about your Forte environment.

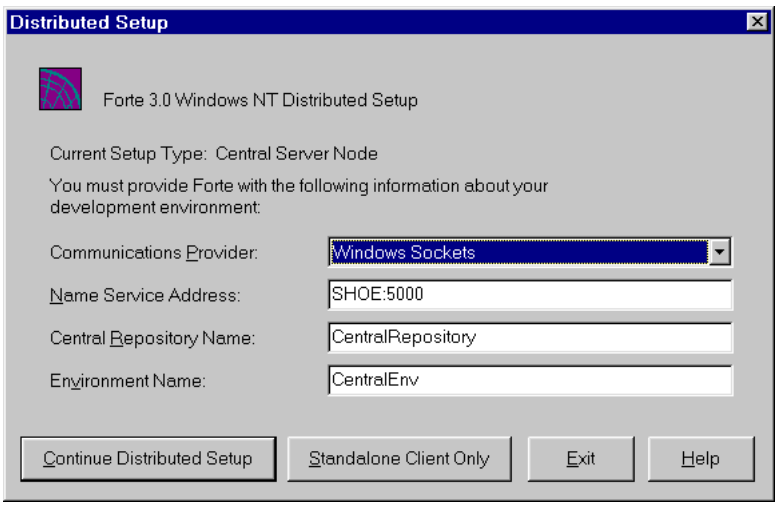


Table 7 on page 40 provides a description of the options available to you. If you do not know what values to specify, simply accept the default values. You can change the values later, either by using the Forte Control Panel or by editing the Windows registry directly, as described in *A Guide to the Forte 4GL Workshops*.

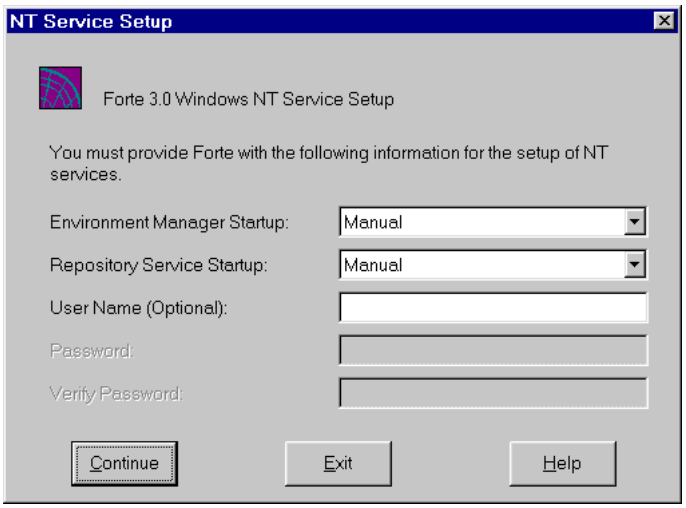
4 Specify values for the node's Forte environment and click **Continue Distributed Setup**.

Standalone client

If you click **Standalone Client Only**, the setup program ignores the specifications in the Distributed Setup dialog and instead continues with a standalone client installation.

Administrator Privileges

If you are installing with Administrator privileges, you can configure the Environment Manager and Repository Service as NT services. The setup program displays the NT Service Setup dialog.



5 In the NT Service Setup dialog, specify how to set up NT services for the Environment Manager and the Repository Service.

Specify Manual or Automatic. If you specify a User Name, then you must provide a password.

If you do not know what values to specify, simply accept the default values. You can change the values later using the Windows NT Control Panel. For more information on configuring Windows NT services, refer to your Windows NT documentation.

6 The setup program proceeds with the installation.

Administrator privileges

If you are installing with Administrator privileges, the setup program prompts you for the location for the Forte program group. If you specify a *personal program group*, Forte is only available to users with Administrator privileges. If you specify a *common program group*, then Forte is available to all users.

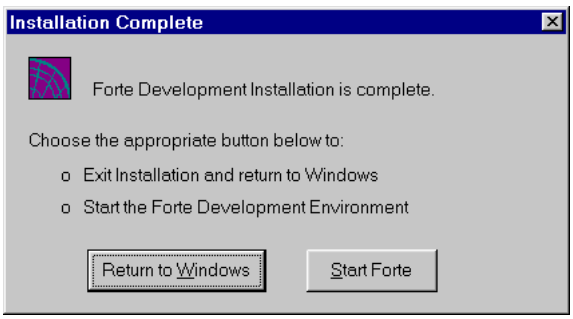
Click **No** for a personal program group

or

Click **Yes** for a common program group.

The setup program creates a Forte program group and installs shortcuts in the Windows Start menu for starting and administering Forte.

When the distributed setup installation is complete, the setup program displays the Installation Complete dialog.



7 Click **Return to Windows** or **Start Forte** to exit the setup program.

If you start Forte, Forte connects to the examples repository created during installation.

Proceed to "After Installing Forte 4GL" on page 52 for more information on your Forte installation.

Custom Installation

This section describes how to perform a custom installation of Forte 4GL software. Use a custom installation to install a simple server or a client node. The custom installation option also provides more flexibility when installing a central server node.

Table 8, below, summarizes the types of installations available when you choose the custom installation option. For more information on each type, refer to "Types of Installations" on page 39.

Table 8 *Types of Custom Installations*

Setup Type	Description
Central Server Node	Specifies that the target node supports Forte server partitions and hosts the Forte system management processes—the Environment Manager and Repository Server—for the Forte environment. For a central server node, you can configure the Forte system management services as Windows NT services. To do this, you must log in as a user with Administrator privileges to perform the installation.
Server Node	Specifies that the target node support Forte server partitions, but is not a central server node. A repository server is not automatically installed.
Client Only (Distributed)	Installs Forte, and configures the node for participation in a Forte environment, establishing appropriate Forte settings in the Windows registry. This option differs from the default Full Distributed Installation only in allowing you to exclude the Forte examples and Forte diagnostic tools from the installation.
Client Only (Standalone)	Installs Forte and prepares the node to run without connection to a Forte environment. Unlike the Client Only (Distributed) option, this option does not add Forte networking information to the Windows registry, nor does it create a shortcut in the Start menu for the Forte node manager. (For information on the changes the setup program makes to the Windows registry, refer to "Forte Registry Keys" on page 55.)
Install Only	Installs only the Forte files on your system, leaving you to configure Forte on your own. This option does not create shortcuts for using Forte, nor does it make any changes to the Windows registry.

In a custom installation, you can specify the following components to install. Not all components are available for all installation options.

Table 9 *Custom Installation Components*

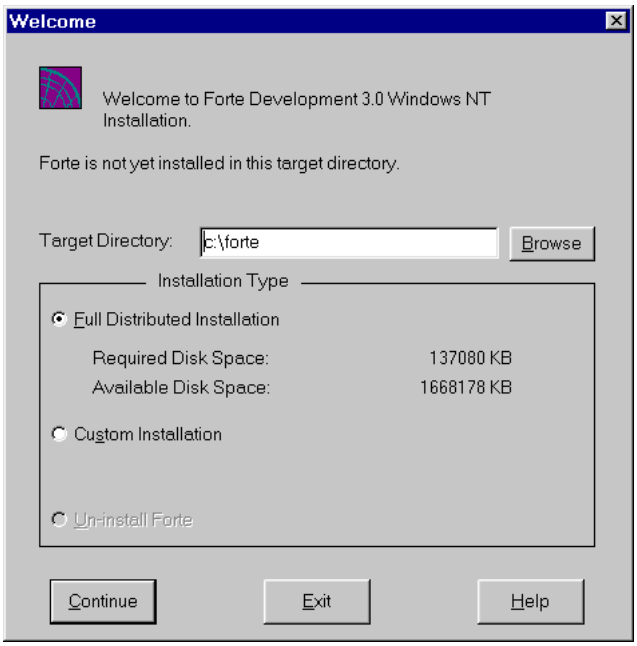
Option	Description
Forte Development System	The files necessary to run the Forte development system. (This option cannot be disabled.)
Forte examples	Several Forte example programs that illustrate how to use TOOL and the Forte classes. Examples are installed in the %FORTE_ROOT%\install directory and consist of .pex (Forte project export) files and other related data files. Additionally, the examples are imported into a special repository, demo30, in the %FORTE_ROOT%\repos directory. For more information on the example programs, refer to the manual, *A Guide to the Forte 4GL Workshops*.
Forte diagnostic tools	Tools for evaluating problems (with help from the Forte technical support team) in your Forte environment.
Forte NT Services	Configures your node to run the Forte environment manager and repository service as Windows NT services; the installation process gives you configuration options for the services during installation. This option is only available to server nodes with Windows NT Administrator privileges.
Forte debug files	Debugging files, each one a companion to a Forte executable or dynamically linked library. These files are debugging tools for use by Forte engineers in evaluating system problems; they are not necessary for using Forte software. You can install them at any time by restarting the setup program.

Note You can bypass automatic configuration of your Forte environment during setup, and instead accept the default values. After completing the installation, you can specify the Forte environment settings from the Forte Control Panel or by editing the Windows registry.

To perform a custom Forte 4GL installation:

1 Start the setup program.

After displaying the splash screen, the setup program displays the Welcome dialog.



Note You can exit the setup program at any time by clicking **Exit**. However, exiting the installation before its completion may leave changes made by the installer in the Windows registry and Forte files on your local disk. Run the setup program's uninstall option to clean up the registry and to remove any installed Forte files.

2 Specify a target directory for the Forte installation

If the target directory you specify does not exist, the setup program creates it for you. The setup program creates the FORTE_ROOT environment variable based on your specification.

3 Select the Custom Installation option, then click **Continue**.

The setup program displays the Custom Installation dialog, which prompts you for the type of installation you are performing and for additional components to install.

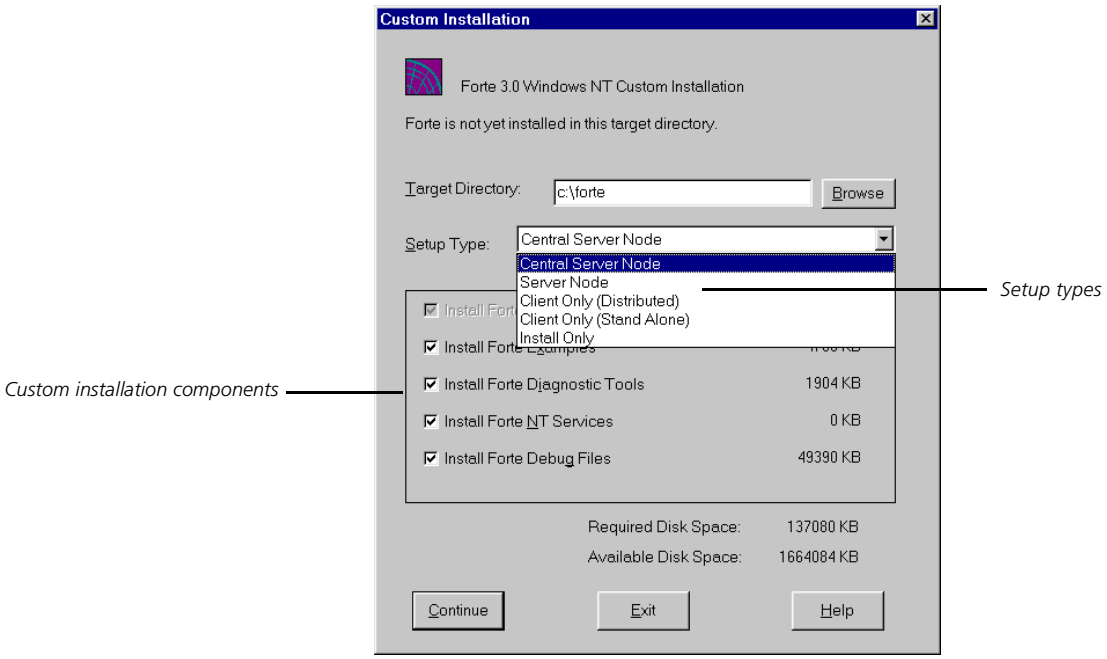


Table 8 on page 45 summarizes the types of installations you can perform. For additional information on each setup type, refer to "Types of Installations" on page 39.

Table 9 on page 45 describes the custom installation components.

4 Select the setup type and custom installation components to install, and then click **Continue**.

Client Only (Standalone) and Install Files Only options

If you selected the Client Only (Standalone) option or the Install Files Only option, there are no additional specifications—the setup program begins the installation. Proceed to Step 7 of this procedure, below.

If you selected a central server node, server node, or client (distributed) node the installer displays the Distributed Setup dialog.

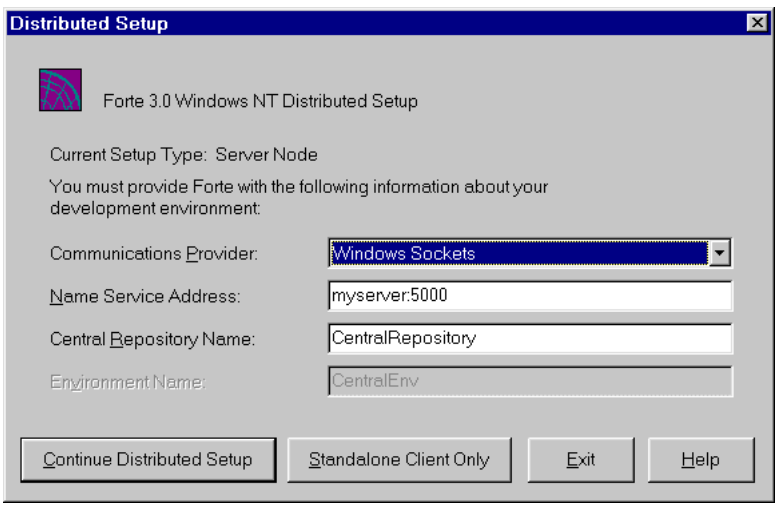


Table 7 on page 40 describes the Distributed Setup options.

5 In the Distributed Setup dialog, enter the appropriate values for the target node and then click either **Continue Distributed Setup** or **Standalone Client Only**.

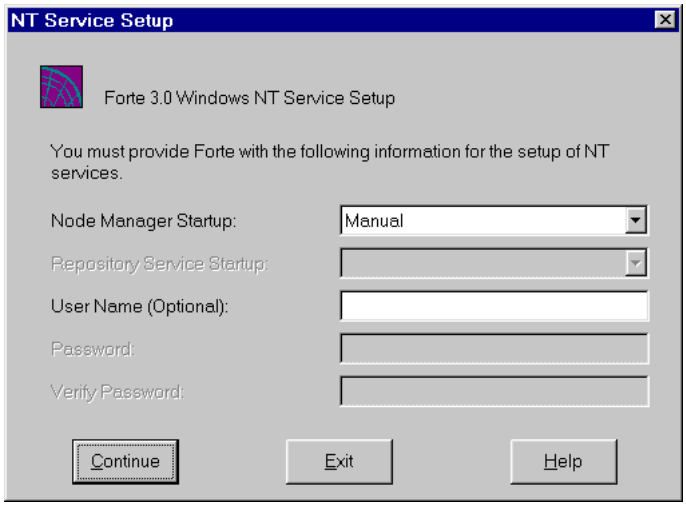
Standalone client

If you click **Standalone Client Only**, the setup program ignores the specifications in the Distributed Setup dialog and instead continues with a standalone client installation.

If you do not know what to specify for a distributed setup, proceed with the default values. After installation is complete, you can add the correct values either by using the Forte Control Panel or by editing the Windows registry.

Administrator Privileges

If you are installing with Administrator privileges, you can configure the Environment Manager and Repository Service as NT services. The setup program displays the NT Service Setup dialog.



6 In the NT Service Setup dialog, specify how to set up NT services.

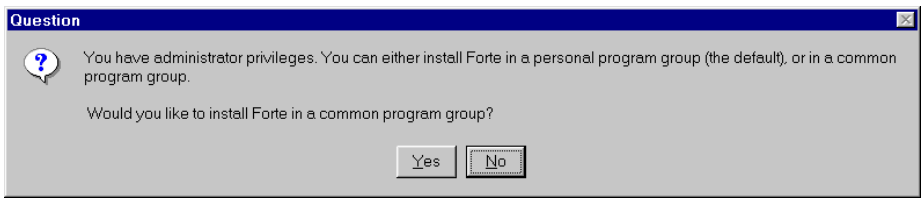
Specify Manual or Automatic for services. If you specify a User Name, then you must provide a password.

If you do not know what values to specify, simply accept the default values. You can change the values later using the Windows NT Control Panel. For more information on configuring Windows NT services, refer to your Windows NT documentation.

7 The setup program proceeds with the installation.

Administrator privileges

If you are installing with Administrator privileges, the setup program prompts you for the location for the Forte program group. If you specify a *personal program group*, Forte is only available to users with Administrator privileges. If you specify a *common program group*, then Forte is available to all users.

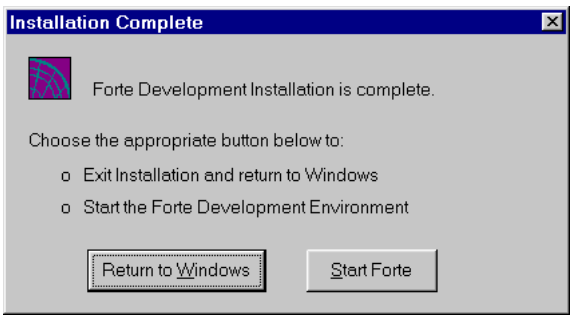


Click **No** for a personal program group

or

Click **Yes** for a common program group.

When the installation is complete, the setup program displays the Installation Complete dialog.



8 Click **Return to Windows** or **Start Forte** to exit the setup program.

If you specify **Start Forte**, Forte runs against the examples repository created during installation (if you specified to install examples).

Proceed to "After Installing Forte 4GL" on page 52 for more information on your Forte installation.

Installing Forte 4GL–Runtime Only

Use the setup program on the *Forte 4GL–Runtime Only CD* to install the Forte 4GL–Runtime Only software. If you are installing Forte 4GL software, refer to "Installing Forte Application Environment" on page 41.

The setup program offers you the following installation options:

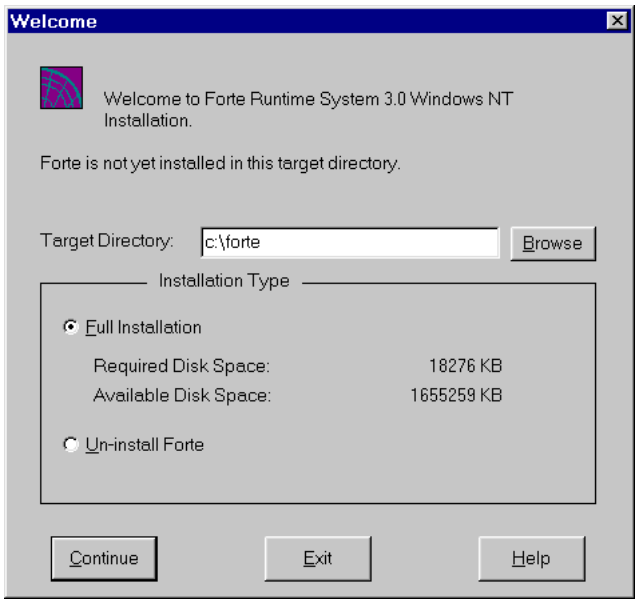
Option	Description
Full Installation	Installs Forte and configures the target node as a runtime client node for a Forte environment.
Uninstall Forte	Uninstalls Forte by removing all Forte files from specified location.

You can only install a runtime client from the *Forte 4GL–Runtime Only CD*. This section describes how to perform a Forte 4GL–Runtime Only installation.

To install a Forte 4GL runtime client:

1 From the *Forte 4GL–Runtime Only CD*, start the setup program (available from the PC_W32 folder).

After displaying the splash screen, the setup program displays the Welcome dialog.



Note

You can exit the setup program at any time by clicking **Exit**. However, exiting the installation before its completion may leave changes made by the installer in the Windows registry and Forte files on your local disk. Run the setup program's uninstall option to clean up the registry and to remove any installed Forte files.

2 Specify a target directory for the Forte installation

If the target directory you specify does not exist, the setup program creates it for you. The setup program creates the FORTE_ROOT environment variable based on your specification.

3 Select the Full Installation option and click **Continue**.

The setup program displays the Distributed Setup dialog, which prompts you for information about your Forte environment.

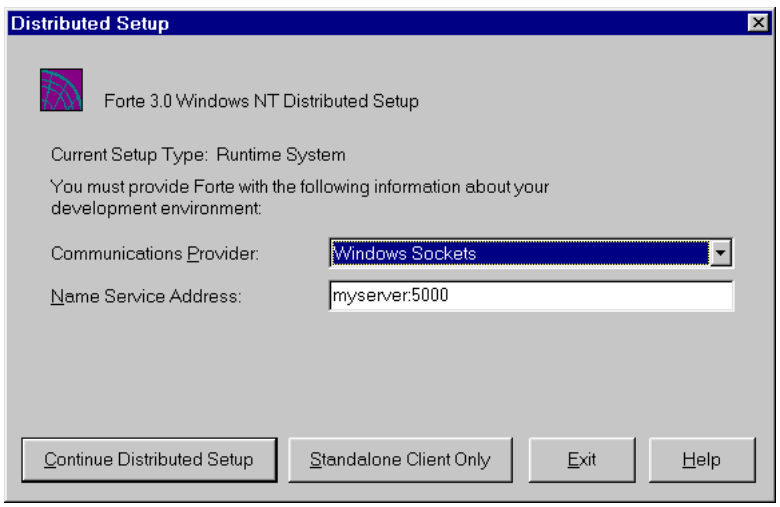
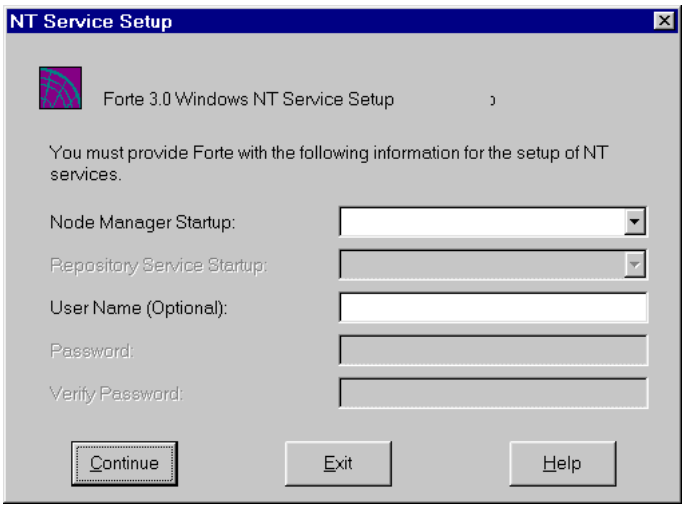


Table 7 on page 40 provides a description of the options available to you. If you do not know what values to specify, simply accept the default values. You can change the values later, either by using the Forte Control Panel or by editing the Windows registry directly, as described in *A Guide to the Forte 4GL Workshops*.

4 Specify values for the node's Forte environment and click **Continue Distributed Setup**.

Administrator privileges

If you have Administrator privileges and Windows NT services were not previously installed, the setup program displays the NT Service dialog.



The setup program installs the Forte Node Manager as a Windows NT service. For Node Manager Startup, specify Manual or Automatic. If you specify a User Name, then you must provide a password. For more information on configuring Windows NT services, refer to your Windows NT documentation.

5 Click **Continue** to proceed with the installation.

During the installation, the setup decompresses Forte files, opens and closes Forte components as necessary, and initializes Forte.

Administrator privileges

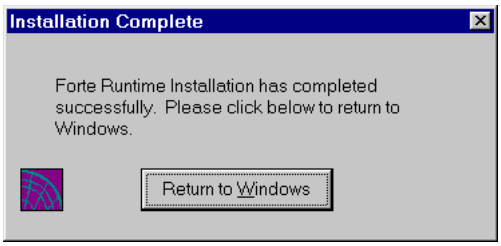
If you are installing with Administrator privileges, the setup program prompts you for the location for the Forte group. If you specify a *personal program group*, Forte is only available to users with Administrator privileges. If you specify a *common program group* then Forte is available to all users.

Click **No** for a personal program group

or

Click **Yes** for a common program group.

The installation proceeds to completion.



6 Click **Return to Windows** to exit the setup program.

Proceed to "After Installing Forte 4GL" on page 52 for more information on your Forte installation.

After Installing Forte 4GL

Your Forte installation on Windows platforms contains the following components:

- FORTE_ROOT directory structure
- Forte registry keys
- Forte shortcuts

Depending on the installation option you choose—full or custom—the Forte setup program installs a different subset of components onto your Windows NT node. The following table shows the components the setup program installs for each installation option:

Installation Option	Components Installed
Full Distributed *central server node*	▮ FORTE_ROOT directory structure ▮ Complete set of fully defined Forte registry keys ▮ Forte central server processes (environment manager and repository service), installed as Windows NT services and configured for automatic startup ▮ Forte example programs (installed in their own repository, named demo30, located in the %FORTE_ROOT%\repos directory) ▮ Forte diagnostic files, placed in the FORTE_ROOT directory structure ▮ Forte debugging files, placed in the FORTE_ROOT directory structure ▮ Shortcuts to Forte executables, placed in a Windows program group and made available from the Windows Start menu
Server *server node*	▮ FORTE_ROOT directory structure ▮ Complete set of fully defined Forte registry keys ▮ Forte server process (node manager) installed as Windows NT services, and configured for automatic startup ▮ Forte example programs (optional) (installed in their own repository, named demo30, located in the %FORTE_ROOT%\repos directory) ▮ Forte diagnostic files (optional), placed in the FORTE_ROOT directory structure ▮ Forte debugging files (optional), placed in the FORTE_ROOT directory structure ▮ Shortcuts to Forte executables, placed in a Windows program group and made available from the Windows Start menu
Custom: Client *Distributed*	▮ FORTE_ROOT directory structure ▮ Complete set of fully defined Forte registry keys ▮ Forte example programs (optional)—placed in the FORTE_ROOT directory structure ▮ Forte diagnostic files (optional)—placed in your FORTE_ROOT directory structure ▮ Shortcuts to Forte executables in your FORTE_ROOT directory structure placed in a Windows program group and made available from the Windows Start menu
Custom: Client *Standalone*	▮ FORTE_ROOT directory structure ▮ Partial set of fully defined Forte registry keys (FORTE_NS_ADDRESS key is not set) ▮ Forte example programs (optional) ▮ Forte diagnostic files (optional) ▮ Shortcuts to Forte executables, placed in a Windows program group and made available from the Windows Start menu
Runtime Client	▮ FORTE_ROOT directory structure
Files Only	▮ FORTE_ROOT directory structure

FORTE_ROOT Directory Structure

FORTE_ROOT is the directory you define as the target directory for your Forte installation. The installation program sets the location of your FORTE_ROOT directory as the value of the FORTE_ROOT environment variable.

Caution Do not change the structure of the FORTE_ROOT directory. The directory structure must remain intact for Forte to function properly—Forte relies on the path links within the structure to locate and use Forte components.

The setup program installs the FORTE_ROOT structure at the location you choose. You can later move the location of FORTE_ROOT, but you must keep the structure intact. If you do move the location of FORTE_ROOT, then you should change any Forte environment variable that defines the location of files and directories in the structure. You can use the Forte Control Panel to redefine these Forte environment variables.

The following table describes the contents of the directory structure defined by FORTE_ROOT:

Directory	Description
appdist	Location for all application and library distribution files created when you make a distribution. Also, user-developed distributions can be placed here from a CD-ROM or other media so they can be deployed in a Forte environment. The Forte installer also places Forte system application distributions in this directory to be deployed when you install Forte system software. Refer to the *Forte 4GL System Management Guide* for more information.
envdist	Exported environment definitions. This directory is empty at installation. For more information about creating and using environment definitions see the *Forte 4GL System Management Guide*.
external	This directory is empty at installation.
install	Files and subdirectories for executing the Forte development system. For a detailed description of the contents of the install subdirectory, see the table below.
log	Forte log files. For information about configuring the Forte logging facilities, see the *Forte 4GL System Management Guide*.
repos	Forte user repositories (including the example programs repository, demo30) created on demand at installation.
sysdata	Contains the environment repository and other information important to the Forte runtime system and Forte system management.
tmp	Files that the Forte system creates for its own use while Forte is running.
userapp	Location for all applications (Forte partitions) and libraries installed on this node. Only application partitions that run on a particular node are installed in the userapp directory of that node. Partitions are installed by Forte system management services during the application deployment process, and can include both user-developed application partitions and Forte system application partitions. Refer to the *Forte 4GL System Management Guide* for more information.
workmsg	Compiled message catalogs that you create for the purpose of internationalizing your Forte applications. For more information about creating compiled message catalogs, and internationalizing your Forte applications, see *Forte 4GL Programming Guide*. This directory is empty at installation.

Install Directory under FORTE_ROOT

The install directory under FORTE_ROOT contains programs, libraries, and other files used to run a Forte system, including:

- executable files
- Forte dynamically linked libraries
- seed repositories
- example programs (if installed)
- scripts
- diagnostic tools

The following table describes the contents of the FORTE_ROOT\install directory:

Install Subdirectory	Contains...
bin	The Forte executables, dynamically linked libraries, debugging files, and a set of Forte batch files.
	The Forte executables (files with .exe extensions) run Forte support processes, system-level applications, some of which, such as ftcmd and ftexec, run Forte image repositories (interpreted applications built in Forte).
	The Forte dynamically linked libraries (files with .dll extensions) are the compiled code extensions to the Forte system.
	The Forte debugging files (files with .pdb extensions) are tools for use by Forte engineers in evaluating system problems; they are not necessary for using Forte software. Each debugging file corresponds to a Forte executable or dynamically linked library.
	The Forte batch files (files with .bat extensions) perform autonomous work using various Forte applications, such as rpclean, escript, and fscript. For more information about using and configuring the batch files in this directory, see the *Forte 4GL System Management Guide*.
diag	The Forte diagnostic tools, for use in consultation with Forte Technical Support specialists to diagnose Forte system problems.
examples	A series of subdirectories containing the Forte example programs, which themselves consist of .pex (Forte project export) and related data files.
inc	A series of directories containing header and class definition files that define the Forte runtime. For example, the ds directory contains files that define the Forte widgets.
lib	3GL libraries for inclusion in Forte applications that you build.
nls	Subdirectories containing native language services files, which you use in building international Forte applications. For information on building international applications, see the *Forte 4GL Programming Guide*.
reposcpy	The seed, or template, for a b-tree repository, and the node's system repository. The seed repository, btseed, consists, like any b-tree format repository, of two files: btseed.btd and btseed.btx. Whenever you use a repository development tool to create a new repository, the Forte system bases the new repository on this btseed template repository. The system repository, consisting of the system.btd and system.btx files, contains the Forte object definitions.
scripts	Forte scripts, some of which the setup program uses in installing Forte on your node, and others which you can use or adapt to automate Forte tasks, such as starting and stopping Forte and Forte components.

Forte Registry Keys

If you install Forte with Administrator privileges, the Forte setup program defines a set of keys in the HKEY_LOCAL_MACHINE hive of the Windows registry as Forte environment variables. If instead you install using User privileges, the setup program adds these Registry changes to your HKEY_CURRENT_USER hive.

Forte uses these keys to configure such things as connecting your node to the services of a Forte environment, and governing internal operations strictly local to your node. Each key is defined as a text string.

The following table lists the environment variables created by the Forte installer for Windows installations.

Forte Key	Definition	Default Value
FORTE_LOGGER_SETUP	A string defining how Forte keeps logs of your use of Forte. You can use the Forte logging facility to track many kinds of Forte processes, to isolate problems in Forte itself, and in Forte applications that you develop. When you start Forte, the runtime system consults this key to determine what logging processes to implement. For more information on how to use Forte log files and the Forte logging facilities, see *Forte 4GL System Management Guide*.	%stdout(err:sh:*)
FORTE_NS_ADDRESS	The Forte name service address for your node. The address of the name service for the Forte environment to which you are connecting your node. The name service is a Forte process running on the Forte environment's central server node, governing Forte communication among nodes in the environment. The address itself consists of two parts, separated by a colon, as in *myserver:5000*, the default value. The first part of the address is the network name of the central server node, and the second part is a number between 1025 and 9000, inclusive.	*myserver*:5000
FORTE_REPOSNAME	The name of a central development repository for the environment.	CentralRepository
FORTE_ROOT	The FORTE_ROOT directory contains your Forte installation: the executables and data files that compose the Forte system. For more information about the contents of the FORTE_ROOT directory structure, see "FORTE_ROOT Directory Structure" on page 53.	c:\forte
INSTALL_DATE	The date of your Forte installation	Today's date
PATH *Environment variable, (but not a registry key)*	Updated to include the path to your Forte executables located in subdirectories of the FORTE_ROOT directory.	The path to the file in your FORTE_ROOT directory: FORTE_ROOT\install\bin

Forte Services

When installing with Administrator privileges, the setup program installs the Forte repository manager and environment manager as Windows NT services. During the installation, you choose how to configure the services.

To view the NT services, from the Windows Control Panel, double-click the Services icon.

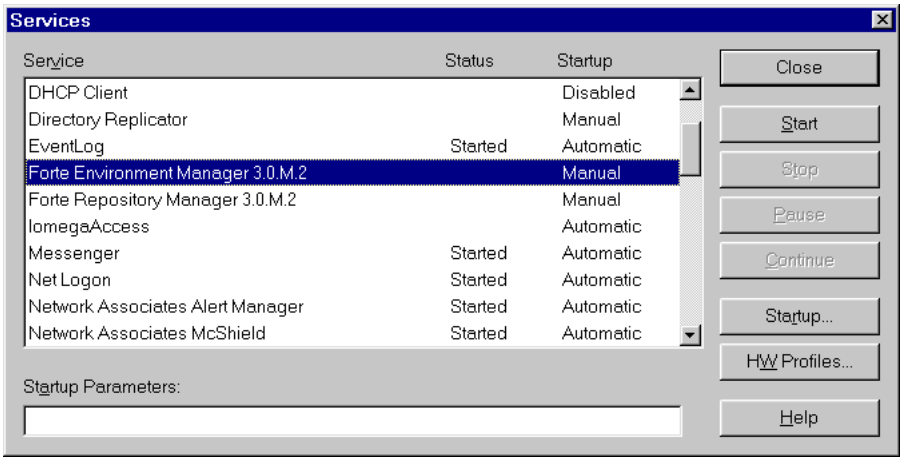


Figure 3 *Forte Services as Windows NT Services*

For more information on configuring Windows NT services, see your Windows NT documentation.

Forte Program Group and Shortcuts

The setup program creates a Windows program group for your Forte installation. The program group contains Windows shortcuts you can use to start and administer Forte. Each shortcut corresponds to a Forte application—either an executable in the %FORTE_ROOT%\install\bin directory, or a Forte image repository in the %FORTE_ROOT%\userapp directory.

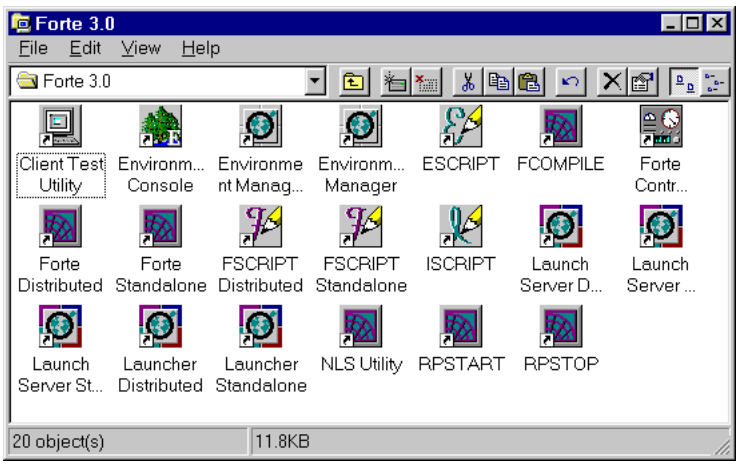


Figure 4 *Forte Program Group*

The Forte shortcuts from the program group are also available from the Windows Start menu, under **Programs** > **Forte**, as shown in Figure 5 below.

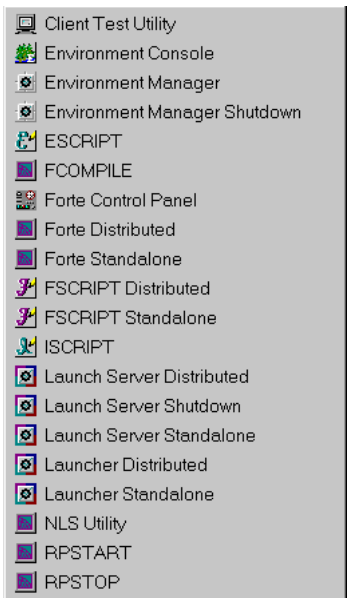


Figure 5 ***Start > Programs > Forte*** *menu*

Forte Distributed Shortcut

Figure 6 below shows the properties of the Forte Distributed shortcut. The shortcut tab illustrates the command path and command to start the FTCMD.EXE executable, which starts the Forte Launch Server. For information on how the Launch Server works to run Forte applications, and on how you can configure the Launch Server to run Forte applications that you develop, refer to the *Forte 4GL System Management Guide*.

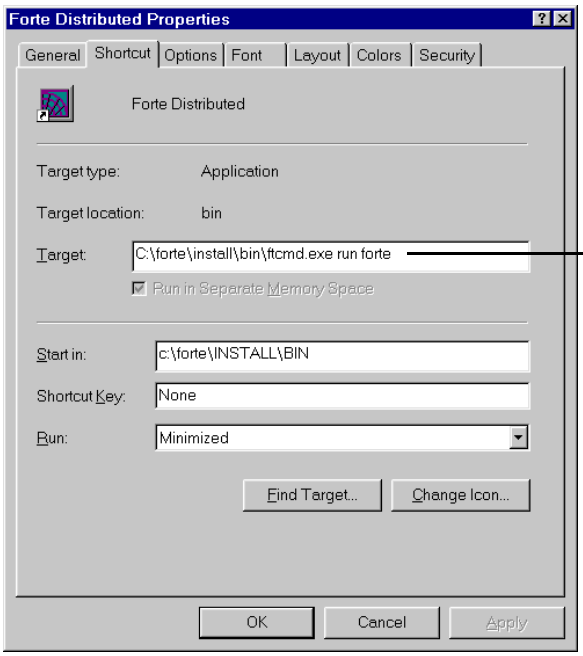


Figure 6 *Forte Distributed Shortcut*

The following table defines the targets for the shortcuts in the Forte program group. Each target is located within the %FORTE_ROOT%\install\bin directory.

Shortcut	Target (*FORTE_ROOT*\install\bin...)
Client Test Utility	FTCMD.EXE run ClientTester
Environment Console	FTCMD.EXE run EnvironmentConsole
Environment Manager	NODEMGR.EXE -e centrale
Environment Manager Shutdown	FTEXEC.EXE -fcons -fi -bt:*FORTE_ROOT*:\forte\USERAPP\ESCRIPT\CL0\ESCRIPT -i *FORTE_ROOT*:\forte\INSTALL\SCRIPTS\SHUTDOWN.SCR
ESCRIPT	FTEXEC.EXE -fcons -fi bt:*FORTE_ROOT*\USERAPP\ESCRIPT\CL0\ESCRIPT -fnw
FCOMPILE	FTEXEC.EXE -fcons -fs -fi bt:*FORTE_ROOT*\USERAPP\FTCOMPIL\CL0\FCOMPILE
Forte Control Panel	FTEXEC.EXE -fs -fss -fi bt:*FORTE_ROOT*:\FORTE\USERAPP\ENVIRONM\CL0\FCONTROL
Forte Distributed	FTCMD.EXE run forte
Launch Server Distributed	FTEXEC.EXE -fss -fi bt:*FORTE_ROOT*\USERAPP\FTLAUNCH\CL0\FTLAUNCH
Launch Server Shutdown	FTCMD.EXE shutdown server
Launch Server Standalone	FTEXEC.EXE -fs -fss -fi bt:*FORTE_ROOT*\USERAPP\FTLAUNCH\CL0\FTLAUNCH
Launcher Distributed	FTCMD.EXE run launcher
Launcher Standalone	FTCMD.EXE -fs run launcher
Forte Standalone	FTEXEC.EXE -fs -fss -fi bt:*FORTE_ROOT*:\FORTE\USERAPP\FORTE\CL0\FORTE
FSCRIPT Distributed	FTEXEC.EXE -fcons -fi bt:*FORTE_ROOT*\USERAPP\FSCRIPT\cl7\FSCRIPT -fw FirstWorkspace -fnict
FSCRIPT Standalone	FTEXEC.EXE -fs -fcons -fi bt:*FORTE_ROOT*\USERAPP\FSCRIPT\cl7\FSCRIPT -fw FirstWorkspace -fnict
ISCRIPT	ISCRIPT.EXE
NLS Utility	FTEXEC.EXE -fs -fi bt:*FORTE_ROOT*\USERAPP\NLSUTIL\CL0\NLSUTIL
NODEMGR	NODEMGR.EXE
RPSTART	RPSTART.EXE -fr bt:central -n CentralRepository
RPSTOP	RPSTOP.EXE -n CentralRepository

Note Most shortcuts invoke the FTCMD or FTEXEC executables (Forte application launching processes), passing command lines arguments to them. For more information on building Forte command lines for Forte utilities, refer to the *Forte 4GL System Management Guide*. For a detailed description of the Forte application launching system, including instructions on how to use it, refer to the *Forte 4GL Programming Guide*.

Chapter 4

Installing Forte on Windows 98/95 Nodes

This chapter describes how to install Forte 4GL software and Forte 4GL–Runtime Only software on Windows 98 and Windows 95 platforms. This chapter also discusses configuring a Windows 98/95 node once you complete installation. The instructions and information in this chapter refer to Windows 98 throughout. However, the instructions and information apply equally to Windows 95.

Note that Windows 98 is certified only as a platform for deployment and development of Forte applications. Refer to Chapter 3, "Installing Forte on Windows NT and Windows 2000 Nodes," for information on installing server nodes on Windows NT and Windows 2000.

Forte 4GL software is installed from the *Forte 4GL Platform CD*. Forte 4GL–Runtime Only software is installed from the *Forte 4GL–Runtime Only CD*. For information on Forte 4GL and Forte 4GL–Runtime Only software, and on the Forte CDs, refer to "Installation Media" on page 19.

Refer to the platform matrix at http://www.forte.com/support/platforms.html for the requirements for this release.

This chapter contains the following sections:

- "Preparing for a Forte Installation" on page 60
- "Installing the Software" on page 62
- "After Installing Forte 4GL" on page 71

Preparing for a Forte Installation

Before beginning a Forte installation, you should read Chapter 1, “Installation Overview” on page 13. Chapter 1 provides background information on Forte that is helpful to planning and installing Forte 4GL and Forte 4GL–Runtime Only software. You should also be familiar with information in the *Forte 4GL System Management Guide* that describes how to set up and maintain a Forte system.

Platform Matrix

Forte has critical dependencies on operating systems, windowing systems, networking systems, runtime libraries, and database management systems. Before installing Forte system software, consult the platform matrix (at http://www.forte.com/support/platforms.html) to make sure the target platform meets the requirements for this release.

Your system must meet the minimal requirements for the following components:

Component	Comments
Operating system	The versions of Microsoft Windows supported.
Windowing system	For Microsoft platforms, this is the native windowing system.
Networking system	Nodes with distributed installations must be able to ping server nodes.
C++ compiler	Required if you intend to integrate 3GL programs with Forte applications or create compiled partitions and libraries.
External interface	Required if you plan distributed access using third party tools.

Types of Installations

“Setting up a Forte 4GL Environment” on page 16 discusses the types of nodes in a Forte environment. During installation, you select the type of node you are installing and provide information during the installation process. For complete information about setting up a Forte environment, refer to the *Forte 4GL System Management Guide*.

The following tables list the types of nodes in a Forte environment that are supported for Windows 98 nodes. They also lists the information you need to supply the installation program. “Forte Environment” on page 61 provides descriptions of the information listed in these tables.

Table 10 *Nodes in a Forte 4GL Environment*

Node	Node Property and Other Information
Client (Distributed)	Target directory Forte Name Service address Distributed repository name Example applications
Client Node (Standalone)	Target directory Example applications
Forte files	This option copies only the Forte directory structure and source files to the target node, leaving the node setup for later.

Table 11 *Nodes in a Forte 4GL–Runtime Only Environment*

Node	Node Property and Other Information
Forte Runtime Client	Target directory Forte Name Service address

Forte Environment

During the installation process, the setup program prompts you for information about your Forte environment. Using the information you provide, setup creates Forte keys in the system registry (also known as Forte environment variables). The information you provide the setup program depends on the type of Forte node you are installing. The following table describes the information you need to provide the installer.

Table 12 *Forte Environment Setup*

Nodes/Information	Description	Default Value
Target directory *all nodes*	The root directory of your Forte installation. The setup program creates the FORTE_ROOT environment variable based on this location.	C:\forte
Communications Provider *client (distributed)* *runtime client*	The communications interface the Windows client uses to run Forte. On Windows NT, Forte supports the Windows Sockets interface exclusively, so you do not need to change the default.	Windows Sockets
Name Service Address *client (distributed)* *runtime client*	The address of the name service for the Forte environment you are establishing. The name service is a Forte process running on the central server node you are installing. The name service governs Forte communication among nodes in the environment. The address consists of the network name of the central server node and the specified port ID, separated by a colon (for example, *myserver*:5000). The port ID must be a number between 1025 and 65536 inclusive. You should be able to ping the server by name if the name is part of the name service address, or by the IP address if the IP address is part of the name service address. The setup program inserts the value you specify into your Windows registry as the value of the FORTE_NS_ADDRESS key in either the HKEY_LOCAL_MACHINE hive (installing with Administrator privileges) or the HKEY_CURRENT_USER hive (installing with User privileges). You can later change this value to connect your node to a different environment by changing the environment variable yourself. For a full description of the changes the setup program makes to your Registry, see "Forte Registry Keys" on page 73.	*myserver*:5000
Central repository name *client (distributed)*	The name of the central development repository the node maintains in its Forte environment for collaborative application development.	CentralRepository

Installing the Software

This section describes the installation procedures to install Forte 4GL and Forte 4GL–Runtime Only software. The installation setup program is available from the distribution CD.

For information on the differences between the Forte 4GL and Forte 4GL–Runtime Only, refer to "About Forte 4GL" on page 14.

For information on accessing the Forte CDs, and the location of the setup program, refer to "Installation Media" on page 19.

Note You cannot install onto a remote disk—the target disk must be directly attached to the target node.

The process for installing Forte 4GL and Forte 4GL–Runtime Only software is the same for all supported Windows platforms. Use the setup program to install Forte or any of its components, upgrade previous Forte installations, or uninstall Forte or any of its components.

Installing Forte Application Environment

Use the setup program on the *Forte 4GL Platform CD* to install the Forte 4GL software. If you are installing Forte 4GL–Runtime Only software, refer to "Installing Forte 4GL–Runtime Only" on page 68.

The setup program offers you the following installation options.

Option	Description
Full Distributed Installation	Installs Forte and configures your node for distributed participation in a Forte environment, establishing Forte environment variable settings in your Windows 95 registry for this purpose.
Custom Installation	Provides options for installing any (or all) of three Forte components: ▮ Forte Development System (the Forte Application Environment software) ▮ Forte Examples (Forte Example Programs) ▮ Forte Diagnostic Tools (tools for evaluating problems in your Forte environment with help from the Forte technical support team.) ▮ Forte Debug Files (files for evaluating problems in your Forte environment with help from the Forte technical support team.)
Uninstall Forte	Uninstalls Forte by removing all Forte files from specified location.

The following sections provide installation procedures for a full distributed installation and a custom installation.

Installation Procedures

This section contains procedures for the following types of Forte Application Environment installations:

- "Full Distributed Installation" on page 63
- "Custom Installation" on page 65

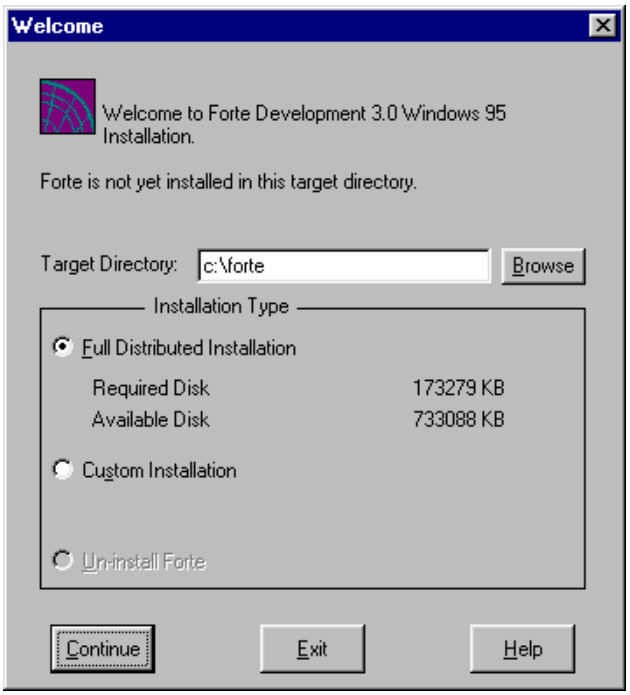
Full Distributed Installation

This section describes how to perform a full distributed Forte installation—the Forte setup program installs and configures your node for distributed participation in Forte environment.

To perform a standard, full distributed Forte 4GL installation:

1. From the *Forte 4GL Platform CD*, start the setup program (available from the PC_W32 folder).

   After displaying the splash screen, the setup program displays the Welcome dialog.



Note — You can exit the setup program at any time by clicking **Exit**. However, exiting the installation before its completion may leave changes made by the installer in the Windows registry and Forte files on your local disk. Run the setup program's uninstall option to clean up the registry and to remove any installed Forte files.

2. Specify a target directory for the Forte installation

   If the target directory you specify does not exist, the setup program creates it for you. The setup program creates the FORTE_ROOT environment variable based on your specification.

3. Select Full Distributed Installation option and click **Continue**.

The setup program displays the Distributed Setup dialog, which prompts you for information about your Forte environment.

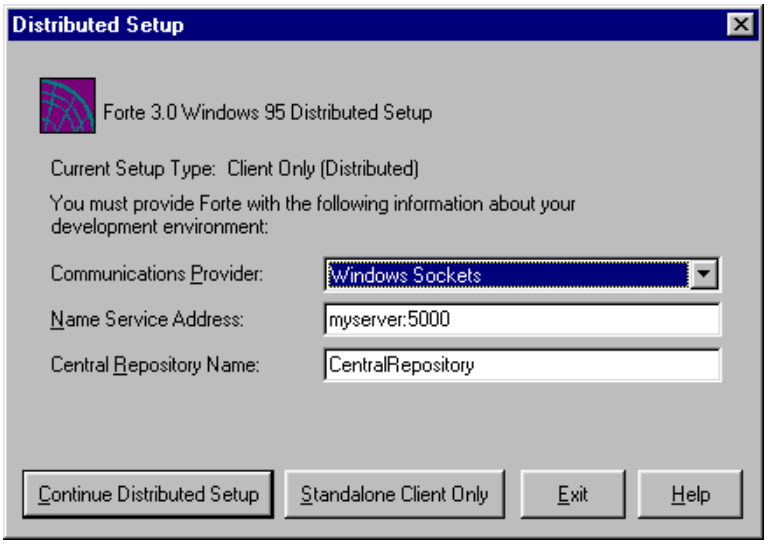


Table 12 on page 61 provides a description of the options available to you. If you do not know what values to specify, simply accept the default values. You can change the values later, either by using the Forte Control Panel or by editing the Windows registry directly, as described in *A Guide to the Forte 4GL Workshops*.

4 Specify values for the node's Forte environment and click **Continue Distributed Setup**.

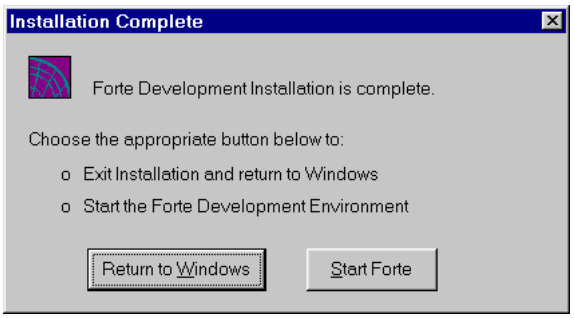
Standalone client

If you click **Standalone Client Only**, the setup program ignores the specifications in the Distributed Setup dialog and instead continues with a standalone client installation.

5 The setup program proceeds with the installation.

The setup program creates a Forte program group and installs shortcuts in the Windows Start menu for starting and administering Forte.

When the distributed setup installation is complete, the setup program displays the Installation Complete dialog.



6 Click **Return to Windows** or **Start Forte** to exit the setup program.

If you start Forte, Forte connects to the examples repository created during installation.

Proceed to "After Installing Forte 4GL" on page 71 for more information on your Forte installation.

Custom Installation

This section describes how to perform a custom installation of Forte 4GL software. A custom installation option provides more flexibility when installing the Forte Application Environment.

Table 13, below, summarizes the types of installations available when you choose the custom installation option. For more information on each type, refer to "Types of Installations" on page 60.

Table 13 *Types of Custom Installations*

Setup Type	Description
Client Only (Distributed)	Installs Forte, and configures the node for participation in a Forte environment, establishing appropriate Forte settings in the Windows registry. This option differs from the default Full Distributed Installation only in allowing you to exclude the Forte examples and Forte diagnostic tools from the installation.
Client Only (Standalone)	Installs Forte and prepares the node to run without connection to a Forte environment. Unlike the Client Only (Distributed) option, this option does not add Forte networking information to the Windows registry, nor does it create a shortcut in the Start menu for the Forte node manager. (For information on the changes the setup program makes to the Windows registry, refer to "Forte Registry Keys" on page 73.)
Install Only	Installs only the Forte files on your system, leaving you to configure Forte on your own. This option does not create shortcuts for using Forte, nor does it make any changes to the Windows registry.

In a custom installation, you can specify the following components to install. Not all components are available for all installation options.

Table 14 *Custom Installation Components*

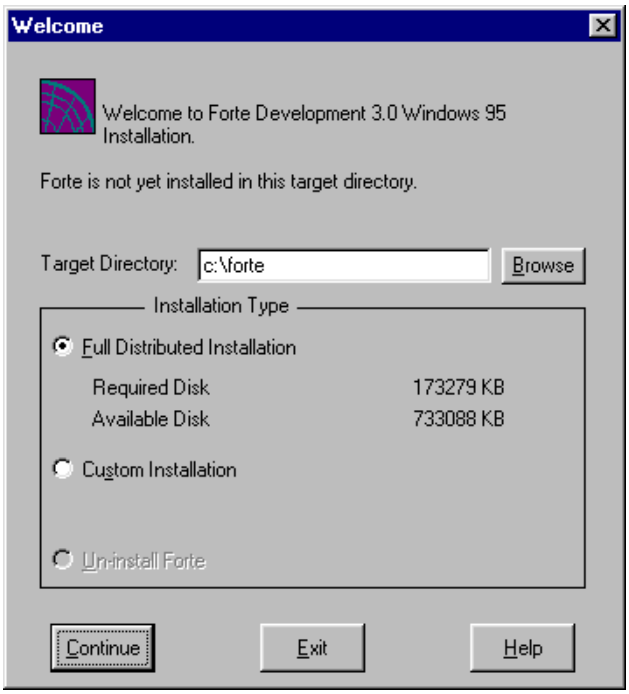
Option	Description
Forte Development System	The files necessary to run the Forte development system. (This option cannot be disabled.)
Forte examples	Several Forte example programs that illustrate how to use TOOL and the Forte classes. Examples are installed in the %FORTE_ROOT%\install directory and consist of .pex (Forte project export) files and other related data files. Additionally, the examples are imported into a special repository, demo30, in the %FORTE_ROOT%\repos directory. For more information on the example programs, refer to the manual, *A Guide to the Forte 4GL Workshops*.
Forte diagnostic tools	Tools for evaluating problems (with help from the Forte technical support team) in your Forte environment.
Forte debug files	Debugging files, each one a companion to a Forte executable or dynamically linked library. These files are debugging tools for use by Forte engineers in evaluating system problems; they are not necessary for using Forte software. You can install them at any time by restarting the setup program.

Note You can bypass automatic configuration of your Forte environment during setup, and instead accept the default values. After completing the installation, you can specify the Forte environment settings from the Forte Control Panel or by editing the Windows registry.

To perform a custom Forte 4GL installation:

1 From the *Forte 4GL Platform CD*, start the setup program (available from the PC_W32 folder).

After displaying the splash screen, the setup program displays the Welcome dialog.



Note You can exit the setup program at any time by clicking **Exit**. However, exiting the installation before its completion may leave changes made by the installer in the Windows registry and Forte files on your local disk. Run the setup program's uninstall option to clean up the registry and to remove any installed Forte files.

2 Specify a target directory for the Forte installation

If the target directory you specify does not exist, the setup program creates it for you. The setup program creates the FORTE_ROOT environment variable based on your specification.

3 Select the Custom Installation option, then click **Continue**.

The setup program displays the Custom Installation dialog, which prompts you for the type of installation you are performing and for additional components to install.

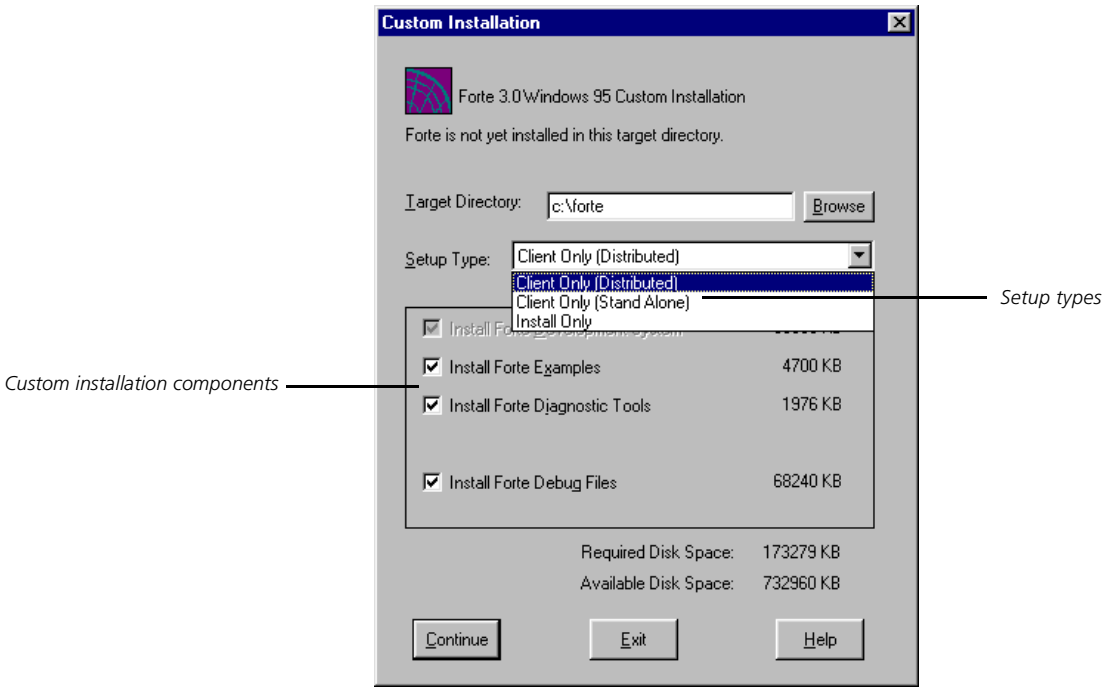


Table 13 on page 65 summarizes the types of installations you can perform. For additional information on each setup type, refer to "Types of Installations" on page 60.

Table 14 on page 65 describes the custom installation components.

4 Select the setup type and custom installation components to install, and then click **Continue**.

Client Only (Standalone) and Install Files Only options

If you selected the Client Only (Standalone) option or the Install Files Only option, there are no additional specifications—the setup program begins the installation. Proceed to Step 6 of this procedure, below.

If you selected a (distributed) node the installer displays the Distributed Setup dialog.

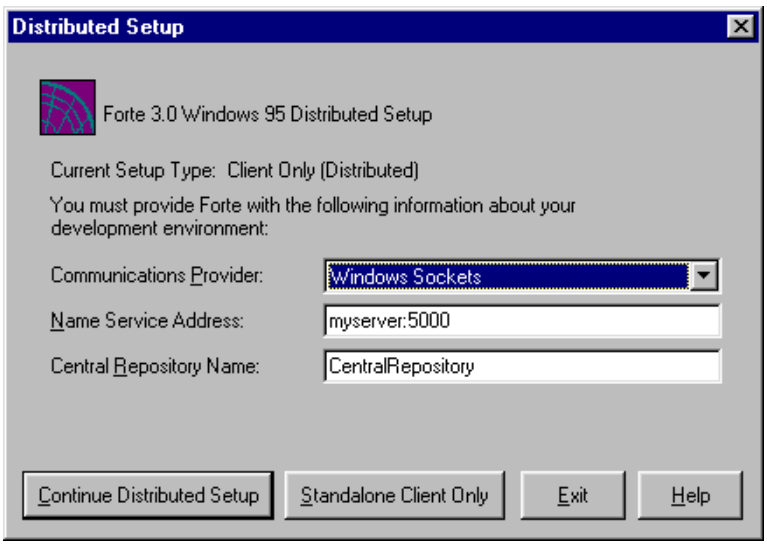


Table 12 on page 61 describes the Distributed Setup options.

5 In the Distributed Setup dialog, enter the appropriate values for the target node and then click either **Continue Distributed Setup** or **Standalone Client Only**.

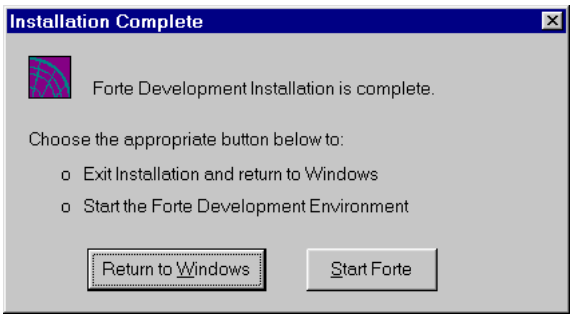
Standalone client

If you click **Standalone Client Only**, the setup program ignores the specifications in the Distributed Setup dialog and instead continues with a standalone client installation.

If you do not know what to specify for a distributed setup, proceed with the default values. After installation is complete, you can add the correct values either by using the Forte Control Panel or by editing the Windows registry.

6 The setup program proceeds with the installation.

When the installation is complete, the setup program displays the Installation Complete dialog.



7 Click **Return to Windows** or **Start Forte** to exit the setup program.

If you specify **Start Forte**, Forte runs against the examples repository created during installation (if you specified to install examples).

Proceed to "After Installing Forte 4GL" on page 71 for more information on your Forte installation.

Installing Forte 4GL–Runtime Only

Use the setup program on the *Forte 4GL–Runtime Only CD* to install Forte 4GL–Runtime Only software. If you are installing Forte 4GL software, refer to "Installing Forte Application Environment" on page 62.

The setup program offers you the following installation options:

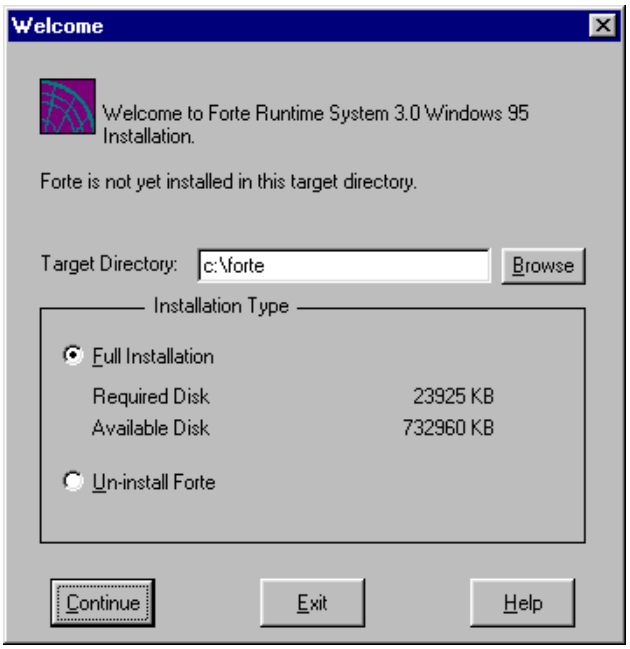
Option	Description
Full Installation	Installs Forte and configures the target node as a runtime client node for a Forte environment.
Uninstall Forte	Uninstalls Forte by removing all Forte files from specified location.

You can only install a runtime client from the *Forte 4GL–Runtime Only CD*. This section describes how to perform a Forte 4GL–Runtime Only installation.

To install a Forte 4GL runtime client:

1 From the *Forte Runtime Environment CD*, start the setup program.

After displaying the splash screen, the setup program displays the Welcome dialog.



Note You can exit the setup program at any time by clicking **Exit**. However, exiting the installation before its completion may leave changes made by the installer in the Windows registry and Forte files on your local disk. Run the setup program's uninstall option to clean up the registry and to remove any installed Forte files.

2 Specify a target directory for the Forte installation

If the target directory you specify does not exist, the setup program creates it for you. The setup program creates the FORTE_ROOT environment variable based on your specification.

3 Select the Full Installation option and click **Continue**.

The setup program displays the Distributed Setup dialog, which prompts you for information about your Forte environment.

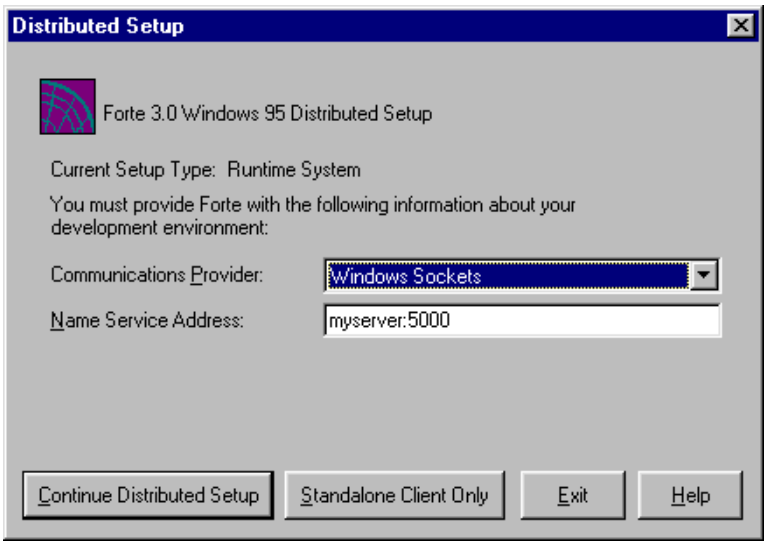
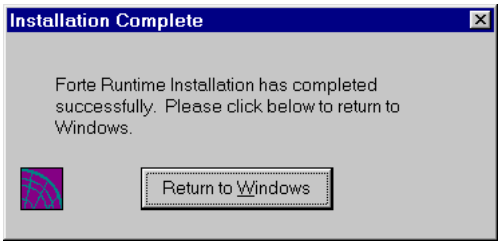


Table 12 on page 61 provides a description of the options available to you. If you do not know what values to specify, simply accept the default values. You can change the values later, either by using the Forte Control Panel or by editing the Windows registry directly, as described in *A Guide to the Forte 4GL Workshops*.

4 Specify values for the node's Forte environment and click **Continue Distributed Setup**.

During the installation, the setup decompresses Forte files, opens and closes Forte components as necessary, and initializes Forte.

The installation proceeds to completion.



5 Click **Return to Windows** to exit the setup program.

Proceed to "After Installing Forte 4GL" on page 71 for more information on your Forte installation.

After Installing Forte 4GL

Your Forte installation on Windows platforms contains the following components:

- FORTE_ROOT directory structure
- Forte registry keys
- Forte shortcuts

Depending on the installation option you choose—full or custom—the Forte setup program installs a different subset of components onto your Windows NT node. The following table shows the components the setup program installs for each installation option:

Installation Option	Components Installed
Client *Distributed*	▮ FORTE_ROOT directory structure ▮ Complete set of fully defined Forte registry keys ▮ Forte example programs (optional)—placed in the FORTE_ROOT directory structure ▮ Forte diagnostic files (optional)—placed in your FORTE_ROOT directory structure ▮ Shortcuts to Forte executables in your FORTE_ROOT directory structure
Client *Standalone*	▮ FORTE_ROOT directory structure ▮ Partial set of fully defined Forte registry keys (FORTE_NS_ADDRESS key is not set) ▮ Forte example programs (optional) ▮ Forte diagnostic files (optional) ▮ Shortcuts to Forte executables, placed in a Windows program group and made available from the Windows Start menu
Runtime Client	▮ FORTE_ROOT directory structure
Files Only	▮ FORTE_ROOT directory structure

FORTE_ROOT Directory Structure

FORTE_ROOT is the directory you define as the target directory for your Forte installation. The installation program sets the location of your FORTE_ROOT directory as the value of the FORTE_ROOT environment variable.

Caution Do not change the structure of the FORTE_ROOT directory. The directory structure must remain intact for Forte to function properly—Forte relies on the path links within the structure to locate and use Forte components.

The setup program installs the FORTE_ROOT structure at the location you choose. You can later move the location of FORTE_ROOT, but you must keep the structure intact. If you do move the location of FORTE_ROOT, then you should change any Forte environment variable that defines the location of files and directories in the structure. You can use the Forte Control Panel to redefine these Forte environment variables.

The following table describes the contents of the directory structure defined by FORTE_ROOT:

Directory	Description
appdist	Location for all application and library distribution files created when you make a distribution. Also, user-developed distributions can be placed here from a CD-ROM or other media so they can be deployed in a Forte environment. The Forte installer also places Forte system application distributions in this directory to be deployed when you install Forte system software. Refer to the *Forte 4GL System Management Guide* for more information.
envdist	Exported environment definitions. This directory is empty at installation. For more information about creating and using environment definitions see the *Forte 4GL System Management Guide*.
external	This directory is empty at installation.
install	Files and subdirectories for executing the Forte development system. For a detailed description of the contents of the install subdirectory, see the table below.
log	Forte log files. For information about configuring the Forte logging facilities, see the *Forte 4GL System Management Guide*.
repos	Forte user repositories (including the example programs repository, demo30) created on demand at installation.
sysdata	Contains the environment repository and other information important to the Forte runtime system and Forte system management.
tmp	Files that the Forte system creates for its own use while Forte is running. This directory is empty at installation.
userapp	Location for all applications (Forte partitions) and libraries installed on this node. Only application partitions that run on a particular node are installed in the userapp directory of that node. Partitions are installed by Forte system management services during the application deployment process, and can include both user-developed application partitions and Forte system application partitions. Refer to the *Forte 4GL System Management Guide* for more information.
workmsg	Compiled message catalogs that you create for the purpose of internationalizing your Forte applications. For more information about creating compiled message catalogs, and internationalizing your Forte applications, see *Forte 4GL Programming Guide*. This directory is empty at installation.

Install Directory under FORTE_ROOT

The install directory under FORTE_ROOT contains programs, libraries, and other files used to run a Forte system, including:

- executable files
- Forte dynamically linked libraries
- seed repositories
- example programs (if installed)
- scripts
- diagnostic tools

The following table describes the contents of the FORTE_ROOT\install directory:

Directory	Description
bin	The Forte executables, shared libraries, and a set of Forte batch files.
	The Forte executables run Forte support processes, system-level applications, some of which, such as ftcmd and ftexec, run Forte image repositories (interpreted applications built in Forte).
	The Forte shared libraries are the compiled code extensions to the Forte system.
	The Forte batch files perform autonomous work using various Forte applications, such as rpclean, Escript, and Fscript. For more information about using and configuring the batch files in this directory, see the *Forte 4GL System Management Guide*.
diag	The Forte diagnostic tools, for use in consultation with Forte Technical Support specialists to diagnose Forte system problems. These tools use the Forte debugging files in the FORTE_ROOT/install/bin directory, described above.
examples	A series of subdirectories containing the Forte example programs, which themselves consist of .pex (Forte project export) and related data files.
inc	A series of directories containing header and class definition files that define the Forte runtime. For example, the ds directory contains files that define the Forte widgets.
lib	3GL libraries for inclusion in Forte applications that you build.
nls	Subdirectories containing native language services files, which are used in building international Forte applications. For information on building international applications, see *Forte 4GL Programming Guide*.
reposcpy	The seed, or template, for a b-tree repository, and the node's system repository.
	The seed repository, btseed, consists, like any b-tree format repository, of two files: btseed.btd and btseed.btx. When you create a new repository, the Forte system bases the new repository on this btseed template repository.
	The system repository, consisting of the system.btd and system.btx files, contains the Forte object definitions.
scripts	Forte scripts, some of which the INSTALL.SH program uses in installing Forte on your node, and others which you can use or adapt to automate Forte tasks, such as starting and stopping Forte and Forte components.

Forte Registry Keys

If you install Forte with Administrator privileges, the Forte setup program defines a set of keys in the HKEY_LOCAL_MACHINE hive of the Windows registry as Forte environment variables. If instead you install using User privileges, the setup program adds these registry changes to your HKEY_CURRENT_USER hive.

Forte uses these keys to configure itself for such things as connecting your node to the services of a Forte environment, and governing internal operations strictly local to your node. Each key is defined as a text string.

The following table lists the environment variables created by the Forte installer for Windows installations.

Forte Key	Definition	Default Value
FORTE_LOGGER_SETUP	A string defining how Forte keeps logs of your use of Forte. You can use the Forte logging facility to track many kinds of Forte processes, to isolate problems in Forte itself, and in Forte applications that you develop. When you start Forte, the runtime system consults this key to determine what logging processes to implement. For more information on how to use Forte log files and the Forte logging facilities, see *Forte 4GL System Management Guide*.	%stdout(err:sh:*)
FORTE_NS_ADDRESS	The Forte name service address for your node. The address of the name service for the Forte environment to which you are connecting your node. The name service is a Forte process running on the Forte environment's central server node, governing Forte communication among nodes in the environment. The address itself consists of two parts, separated by a colon, as in *myserver:5000*, the default value. The first part of the address is the network name of the central server node, and the second part is a number between 1025 and 9000, inclusive.	*myserver*:5000
FORTE_REPOSNAME	The name of a central development repository for the environment.	CentralRepository
FORTE_ROOT	The FORTE_ROOT directory contains your Forte installation: the executables and data files that compose the Forte system. For more information about the contents of the FORTE_ROOT directory structure, see "FORTE_ROOT Directory Structure" on page 71.	c:\forte
INSTALL_DATE	The date of your Forte installation	Today's date
PATH *Environment variable, but not a registry key.*	Updated to include the path to your Forte executables located in subdirectories of the FORTE_ROOT directory.	The path to the file in your FORTE_ROOT directory: FORTE_ROOT\install\bin

Forte Program Group and Shortcuts

The setup program creates a Windows program group for your Forte installation. The program group contains Windows shortcuts you can use to start and administer Forte. Each shortcut corresponds to a Forte application—either an executable in the %FORTE_ROOT%\install\bin directory, or a Forte image repository in the %FORTE_ROOT%\userapp directory.

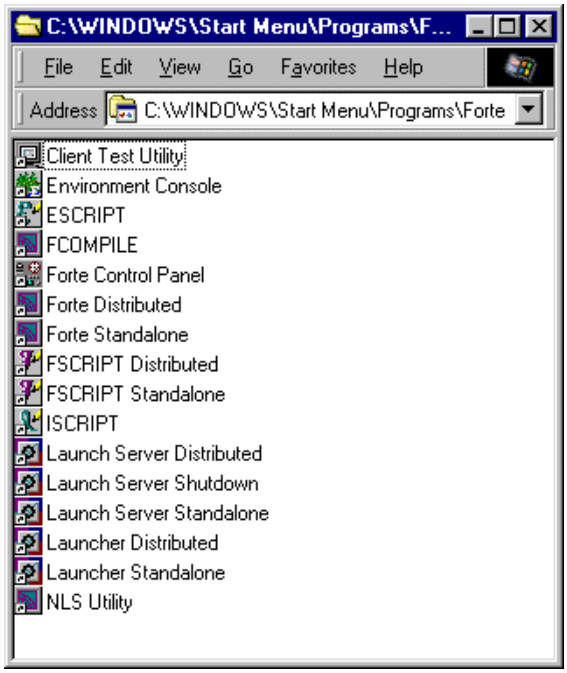


Figure 7 *Forte Program Group*

The Forte shortcuts from the program group are also available from the Windows Start menu, under **Programs** > **Forte**, as shown in Figure 8 below.

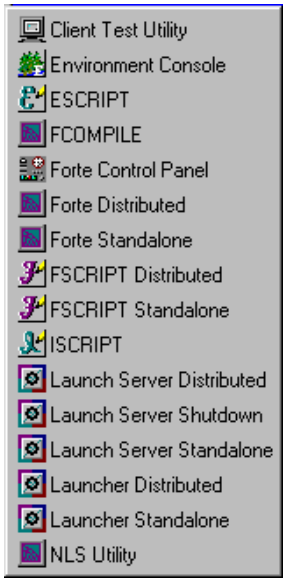


Figure 8 ***Start > Programs > Forte*** *menu*

Forte Distributed Shortcut

Figure 9 below shows the properties of the Forte Distributed shortcut. The shortcut tab illustrates the command path and command to start the FTCMD.EXE executable, which starts the Forte Launch Server. For information on how the Launch Server works to run Forte applications, and on how you can configure the Launch Server to run Forte applications that you develop, refer to the *Forte 4GL System Management Guide*.

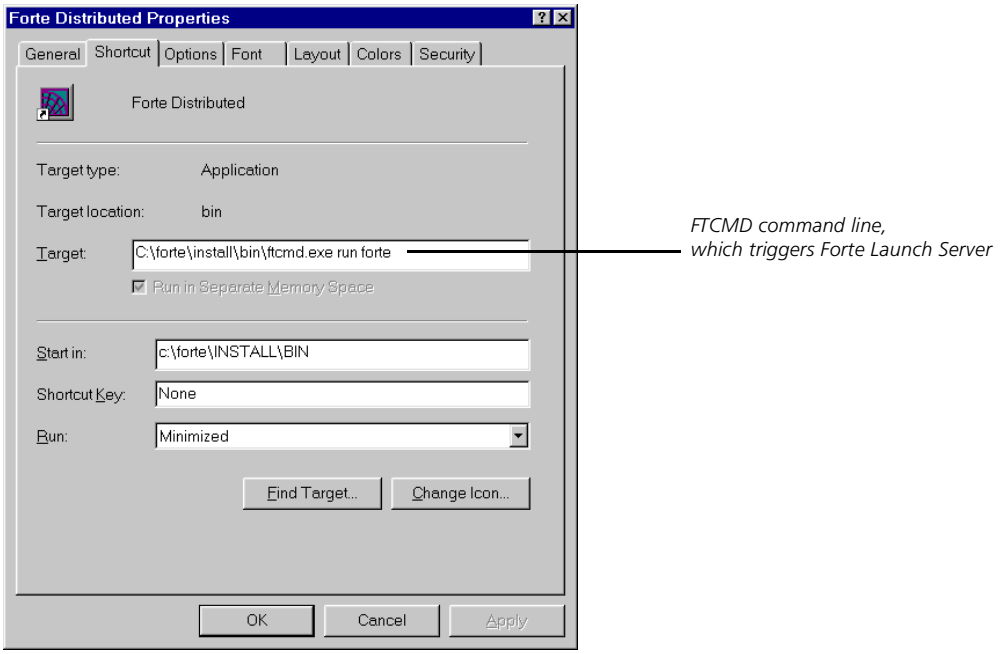


Figure 9 *Forte Distributed Shortcut*

The following table defines the targets for the shortcuts in the Forte program group. Each target is located within the %FORTE_ROOT%\install\bin directory.

Shortcut	Target (*FORTE_ROOT*\install\bin...)
Client Test Utility	FTCMD.EXE run ClientTester
Environment Console	FTCMD.EXE run EnvironmentConsole
ESCRIPT	FTEXEC.EXE -fcons -fi bt:*FORTE_ROOT*\USERAPP\ESCRIPT\CL0\ESCRIPT -fnw
FCOMPILE	FTEXEC.EXE -fcons -fs -fi bt:*FORTE_ROOT*\USERAPP\FTCOMPIL\CL0\FCOMPILE
Forte Control Panel	FTEXEC.EXE -fs -fss -fi bt:*FORTE_ROOT*:\FORTE\USERAPP\ENVIRONM\CL0\FCONTROL
Forte Distributed	FTCMD.EXE run forte
Launch Server Distributed	FTEXEC.EXE -fss -fi bt:*FORTE_ROOT*\USERAPP\FTLAUNCH\CL0\FTLAUNCH
Launch Server Shutdown	FTCMD.EXE shutdown server
Launch Server Standalone	FTEXEC.EXE -fs -fss -fi bt:*FORTE_ROOT*\USERAPP\FTLAUNCH\CL0\FTLAUNCH
Launcher Distributed	FTCMD.EXE run launcher
Launcher Standalone	FTCMD.EXE -fs run launcher
Forte Standalone	FTEXEC.EXE -fs -fss -fi bt:*FORTE_ROOT*:\FORTE\USERAPP\FORTE\CL0\FORTE
FSCRIPT Distributed	FTEXEC.EXE -fcons -fi bt:*FORTE_ROOT*\USERAPP\FSCRIPT\cl7\FSCRIPT -fw FirstWorkspace -fnict
FSCRIPT Standalone	FTEXEC.EXE -fs -fcons -fi bt:*FORTE_ROOT*\USERAPP\FSCRIPT\cl7\FSCRIPT -fw FirstWorkspace -fnict
ISCRIPT	ISCRIPT.EXE
NLS Utility	FTEXEC.EXE -fs -fi bt:*FORTE_ROOT*\USERAPP\NLSUTIL\CL0\NLSUTIL

Note Most shortcuts invoke the FTCMD or FTEXEC executables (Forte application launching processes), passing command lines arguments to them. For more information on building Forte command lines for Forte utilities, refer to the *Forte 4GL System Management Guide*. For a detailed description of the Forte application launching system, including instructions on how to use it, refer to the *Forte 4GL Programming Guide*.

Chapter 5

Installing Forte on an OpenVMS Node

This chapter describes how to install Forte 4GL software and Forte 4GL–Runtime Only software on OpenVMS systems running on Alpha hardware. This chapter also discusses configuring an OpenVMS node once you complete installation.

Forte 4GL software is installed from the *Forte 4GL Platform CD*. Forte 4GL–Runtime Only software is installed from the *Forte 4GL–Runtime Only CD*. For information on Forte 4GL and Forte 4GL–Runtime Only software, and on the Forte CDs, refer to "Installation Media" on page 19.

Before beginning your installation, refer to the platform matrix at http://www.forte.com/support/platforms.html for the requirements for this release.

This chapter contains the following sections:

- "Preparing for a Forte Installation"
- "Installation Procedures"
- "After Installing Forte"
- "Configuration Notes"

Preparing for a Forte Installation

Before beginning a Forte installation, you should read Chapter 1, “Installation Overview” on page 13. Chapter 1 provides background information on Forte that is helpful to planning and installing Forte 4GL and Forte 4GL–Runtime Only software. You should also be familiar with information in the *Forte 4GL System Management Guide* that describes how to set up and maintain a Forte system.

Platform Matrix

Forte has critical dependencies on operating systems, windowing systems, networking systems, runtime libraries, and database management systems. Before installing Forte system software, consult the platform matrix (at http://www.forte.com/support/platforms.html) to make sure the target platform meets the requirements for this release.

Your system must meet the minimal requirements for the following components:

Component	Comments
Operating system	The version of the OpenVMS operating system supported for this release.
Windowing system	The type and version of the windowing system.
Networking system	Nodes with distributed installations must be able to ping server nodes.
C++ compiler	Required if you intend to integrate 3GL programs with Forte applications or create compiled partitions and libraries.
Database systems	Required if you plan to access databases through Forte. The database environment variable for supported databases must refer to a valid database installation before you install Forte. Additionally, access to the database must be defined according to the database vendor’s instructions.

Disk Space Requirements

A Forte installation requires disk space in two separate areas, which may or may not be on the same disk device.

First, VMSINSTAL restores the installation savesets into a *working directory*. By default, this directory is on the system disk. However, you can specify an alternate device and directory for VMSINSTAL to use as a working directory by specifying the AWD option with VMSINSTAL.

Second, the installation procedure creates a *Forte directory tree* on a target device you specify during installation, and installs most Forte files into this tree.

The following table lists the approximate disk space required for installing Forte 4GL and Forte 4GL–Runtime Only software. Both the working directory and Forte directory tree areas require this disk space. The actual disk space may vary, depending on the installation options you choose and the version of Forte you are installing.

Forte Configuration	Blocks During Installation
Full Forte Application Environment installation	309,000
Full Forte Runtime Environment installation	188,000

▶ **To check the available disk space on your disks, enter the following commands:**

```
$ SHOW DEVICES SYS$SYSTEM
$ SHOW DEVICES target_device
```

Note If possible, you should avoid installing Forte on the system disk or any heavily used disk.

Modifying System Parameters

The installation procedure creates the following file, which by default installs the Forte shared libraries as known images:

SYS$STARTUP:FORTE_STARTUP_*version*.COM

Note Even if you are in a single user environment, Forte uses multiple processes.

You may need to adjust several system parameters to support Forte processes. You may also need to adjust the parameters for global pages and global sections, as well as the settings for VIRTUALPAGECNT and WSMAX. The following table shows the minimum settings you should give to these parameters to ensure that Forte runs properly:

Platform	Global Pages	Global Sections	VIRTUALPAGECNT	WSMAX
Alpha/OpenVMS	50,000	50	500,000 with Motif 270,000 without Motif	60,000

If the total number of global pages and sections required by Forte is greater than that available, to install the desired images it may be necessary to increase the GBLPAGES and GBLSECTIONS SYSGEN parameters.

Setting Global Pages and Sections

To find out how many global pages and sections are currently available for Forte, enter the following commands:

```
$ WRITE SYS$OUTPUT F$GETSYI("FREE_GBLPAGES")
$ WRITE SYS$OUTPUT F$GETSYI("FREE_GBLSECTS")
```

In addition, the VIRTUALPAGECNT and WSMAX parameters act as a ceiling on the process PGFLQUO and WORKING SET quotas, respectively, and may also need to be adjusted. The VIRTUALPAGECNT parameter must be set to at least 150,000.

Also, make sure that your page file has at least 100K free blocks.

Checking Operating System and Software Versions

The Forte development environment has critical dependencies on operating systems and software, as discussed in "Platform Matrix" on page 80. This section describes how to verify that your system meets these requirements.

OpenVMS System

The supported OpenVMS architecture and version are listed in the platform matrix at http://www.forte.com/support/platforms.html. To check your OpenVMS architecture, enter the following command:

```
$ WRITE SYS$OUTPUT F$GETSYI("ARCH_NAME")
```

To check your OpenVMS version, enter the following command:

```
$ WRITE SYS$OUTPUT F$GETSYI("VERSION")
```

Motif Runtime Libraries

You must have the supported version of the Motif runtime libraries, as listed in the platform matrix at http://www.forte.com/support/platforms.html. Several Forte executable images are linked with the Motif runtime libraries. To verify that these runtime libraries are present on your system, enter the following command to search for the Motif runtime libraries:

```
$ DIRECTORY SYS$SHARE:DECW$XMLIBSHR
```

To determine the version numbers of all DEC window images and libraries used, enter the following command:

```
$ @SYS$UPDATE:DECW$VERSIONS ALL
```

Network Support

Forte supports both DECnet and TCP/IP communication protocols, as discussed in the section "Platform Matrix" on page 80.

DECnet

To verify that DECnet is installed, enter the following command:

```
$ MCR NCP SHOW EXECUTOR Characteristics
```

The maximum links value should be at least 64. If it is not, enter the following commands (you need 8 links for each Forte server process, or partition, you run on your OpenVMS server):

```
$ MCR NCP DEFINE EXECUTOR MAXIMUM LINKS 64
$ MCR NCP SET    EXECUTOR MAXIMUM LINKS 64
```

TCP/IP

For a Forte TCP/IP stack, you can use either Compaq TCP/IP Service for OpenVMS (formerly called UCX) or Multinet.

UCX

To verify that Compaq TCP/IP Service for Open VMS is installed, enter the following command:

```
$ UCX SHOW COMMUNICATION
```

If you are using Compaq TCP/IP Services for OpenVMS, it is recommended that you do not use TCP/IP communications unless you have at least version 4.0 installed. To check the version of Compaq TCP/IP Service for OpenVMS that you are running, enter the following command:

```
$ UCX SHOW VERSION
```

The version displayed should correspond to that listed in the platform matrix at http://www.forte.com/support/platforms.html.

Multinet

Alternatively, to verify that Multinet is present on the system, enter the following command:

```
$ write sys$output f$search(f$trnlnm("MULTINET_NETWORK_IMAGE"))
```

If the file MULTINET_NETWORK_IMAGE is found, then you determine if Multinet is installed, and the version number, by entering the following command:

```
$ MULTINET SHOW /VERSION
```

The version displayed should correspond to that listed in the platform matrix at http://www.forte.com/support/platforms.html.

Compaq C and C++ Compiler and Runtime Libraries

Forte software requires a Compaq C++ compiler and runtime libraries as discussed in the section "Platform Matrix" on page 80. Your database vendor may also require specific versions of the Compaq C compiler and runtime libraries. To verify the version numbers of the compilers on your system, issue the following commands:

Compaq C++

```
$ CXX /VERSION NL:
```

Compaq C

```
$ CC /VERSION NL:
```

To verify the runtime libraries, look for their respective disk images using the following commands:

Compaq C++

```
$ DIRECTORY SYS$SHARE:CXXL$011_SHR
```

Compaq C

```
$ DIRECTORY SYS$SHARE:DECC$SHR
```

Required Target Directory Structure

If you intend to provide DOS clients access to your Forte installation, the directory structure should conform to an 8.3 naming structure. For directories, simply use names of eight or fewer characters.

Types of Installations

"Setting up a Forte 4GL Environment" on page 16 discusses the types of nodes in a Forte environment. During installation, you select the type of node you are installing and provide information during the installation process.

The following tables list the types of nodes in a Forte environment, and the information you need to supply the installation program. "Forte Environment Information" on page 84 provides descriptions of the information listed in these tables.

For complete information about setting up a Forte environment, refer to the *Forte 4GL System Management Guide*.

Note When installing Forte on a node that supports a repository server, you should set a minimum value of 200,000 for the paging file quota on the FORTE server account.

Table 15 *Nodes in a Forte 4GL Environment*

Node Type	Information Provided During Installation
Central Server	Installation path (Node manager address) Communication protocol (DECnet or TCP/IP) Forte Name Service address Environment name Central repository name Example applications Database pathnames
Server	Installation path (Node manager address) Communication protocol (DECnet and/or TCP/IP) Central server node's Forte Name Service address Distributed repository name Example applications Database pathnames
Client Only	Installation path (Node manager address) Central server node's Forte Name Service address Distributed repository name Example applications

Table 16 *Nodes in a Forte 4GL–Runtime Only Environment*

Node Type	Information Provided During Installation
Forte Runtime Client	Installation path (Node manager address) Forte Name Service address

Forte Environment Information

The following table provides details on the information you need to provide during the installation process for Forte 4GL or the Forte 4GL–Runtime Only. For information on the types of nodes you can install, refer to "Types of Installations" on page 83.

Information/Nodes	Description	Default Value
Installation path *all nodes*	Location of the Forte directory structure. This location becomes the value of the FORTE_ROOT environment variable.	SYS$SYSDEVICE:[000000]
DECnet communication: Forte Name Service Address *central server* *server*	If you choose DECnet as one of the node's protocols, you must provide the DECnet name service ID (DECnet object name). The installer uses the central server node name plus this ID to set the value of the FORTE_NS_ADDRESS environment variable. The name service ID is a unique, case-sensitive, alphanumeric DECnet object name less than or equal to 8 characters in length; for example, forte_ns.	FORTE_NS
TCP/IP communication: Forte Name Service Address *central server* *server*	If you choose TCP/IP as one of the node's protocols, you must provide the TCP/IP name service ID (port socket number). Use a value between 1025 and 9000, inclusive. The installer uses the central server node name plus this ID to set the value of the FORTE_NS_ADDRESS environment variable.	5000
Environment name *central server*	A name used in managing the environment. If you plan to connect environments, each environment name should be unique to simplify specification in search paths.	CentralEnv
Central repository name *central server* *server* *client only*	The name of the central development repository a node uses in its Forte environment for collaborative application development.	CentralRepository
Example applications *central server* *server* *client only*	Several Forte example programs that illustrate how to use TOOL and the Forte classes. Examples are installed in the FORTE_ROOT:[INSTALL] directory and consist of .PEX (Forte project export) files and other related data files. For more information on the example programs, refer to the manual, *A Guide to the Forte 4GL Workshops*.	*install examples*
Local Oracle database *central server* *server* *runtime client*	The name and/or installation path for an Oracle database. Typically, you verify ORA_ROOT and supply the Oracle SID and the name of your Oracle database.	

The installer also prompts you for the following information:

Requested Information	Descriptions
SYS$TIMEZONE_DIFFERENTIAL	Forte provides support for internationalization through logical names: ▮ FORTE_TIMEZONE ▮ FORTE_TIMEZONE_MIN ▮ FORTE_TIMEZONE_DST During installation, you can modify the SYS$TIMEZONE_DIFFERENTIAL. Consult your system administrator before changing the SYS$TIMEZONE_DIFFERENTIAL
Forte server account	You can specify that the installer create this account, with a username of "FORTE." This account contains the recommended process quotas for running Forte software.
Installation verification	You can specify that the installation verification procedure runs after installation.

Installation Procedures

This section describes the installation procedures to install Forte 4GL and Forte 4GL–Runtime Only software using the VMSINSTAL utility. The installation files used by VMSINSTAL consist of a set of savesets that are in the *CD_ROM_device_name*:[AXP_VMS] directory of the distribution CD.

For information on the differences between the Forte 4GL and Forte 4GL–Runtime Only, refer to "About Forte 4GL" on page 14.

Before you begin the installation procedure, you must first mount the distribution CD, as described in the following installation procedures. For additional information about the distribution media, refer to "Installation Media" on page 19.

During installation, the VMSINSTAL program:

- requests environment information from you
- copies the FORTE_ROOT directory structure to your target node
- sets Forte logical names on your node
- (optionally) runs Forte servers as detached processes

Installing Forte 4GL

The following steps describe how to use the VMSINSTAL utility to install the Forte Application Environment on an OpenVMS node. If you are installing Forte Runtime Environment software, refer to "Installing Forte 4GL–Runtime Only" on page 89.

During installation, the install program offers you the following options:

Option	Description
Install Central Server Node	A central server node supports Forte server partitions and hosts the Forte system management processes—the Environment Manager and Repository Server—for a Forte environment.
Install Server Node	A server node supports Forte server partitions, but is not a central server node.
Install Client–Only Node	A client-only node cannot run any Forte server partitions, but is used to develop or run Forte applications.
Install Files Only	This option copies only the Forte directory structure and source files to the target node, leaving the node setup for later.

For more information on setting up a Forte environment, refer "Setting up a Forte 4GL Environment" on page 16. For a description of the information you must supply during installation, refer to "Types of Installations" on page 83.

During the installation process, to accept any default values, press the **Enter** or **Return** key.

To install Forte 4GL software on an OpenVMS node:

1 Mount the source directory for the installation.

If you are installing from the *Forte 4GL Platform CD*, log in to a privileged account and mount the CD–ROM drive.

The following examples illustrate the mount commands:

```
MOUNT/MEDIA=CDROM /UNDEFINED_FAT=(FIXED:NONE:32256) -
_$CD_ROM_device_name: -
_$FORTEDEV CD
```

Alternatively, you can run the following DCL procedure, which assists with the mount command for the CD-ROM.

```
$! Forte_CD.com:
$! Mount a Forte software distribution CD-ROM on an
$! OpenVMS node without specifying the volume name.
$! usage:
$! @Forte_CD device_name
$! example:
$! @FORTE_CD DKA600:
$!
$ devnam = f$getdvi(p1,"DEVNAM")
$ mount/noassist/override=identification 'devnam'
$ volume = f$getdvi(devnam,"VOLNAM")
$ dismount 'devnam'
$ mount/system/media=cdrom/undefined_fat=(FIXED:NONE:32256) -
 'devnam' 'volume' cd
```

2 Start VMSINSTAL, using "FORTD" as the saveset name. For example:

```
$ @SYS$UPDATE:VMSINSTAL FORTD CD_ROM_device_name:[AXP_VMS]
```

By default, VMSINSTAL restores the savesets to a temporary working directory on the system disk. If there is not enough free space on the system disk, this operation fails.

You can specify a VMSINSTAL alternate working disk by adding the following option to the VMSINSTAL command above:

```
OPTIONS AWD=disk:[dir]
```

3 Respond to VMSINSTAL prompts.

VMSINSTAL displays active non-system processes and prompts you to continue or abort the installation. It also prompts you to confirm the backup of your system disk.

Caution If any non-system processes are active, it is advisable to check with your system administrator before proceeding.

4 If applicable, confirm the OpenVMS version and shareable images.

The installation program performs a pre-installation check of the OpenVMS version and the versions on all Forte-required system shareable images. If the versions are compatible, the installation continues. If the versions are not compatible, the VMSINSTAL displays the current OpenVMS version, and prompts you whether to continue or abort the installation.

5 Enter the device name of the target node for the Forte software.

If Forte has been previously installed (that is, if FORTE_ROOT is defined in your environment), you are asked whether you want to install in the same location.

If Forte has not been previously installed, the installation program suggests the location SYS$SYSDEVICE:[000000]. However, you typically install Forte on a disk other than SYS$SYSDEVICE.

The VMSINSTAL program uses the location of the directory you specify to set the value of the rooted logical name FORTE_ROOT.

Caution Make sure that FORTE_ROOT points to the name of the physical device, *not* to a logical device name.

The VMSINSTAL program then displays the following options:

```
 Forte Installation Menu
 ----- ------------ ----
  1 - Install & Setup for Central Server Node
  2 - Install & Setup for Server Node
  3 - Install & Setup for Client Node Only
  4 - Install Only
  q - Exit Installation Program
* Enter your choice [4]:
```

6 Select an installation option.

Refer to "Types of Installations" on page 83 for information on these installation options.

7 The installation program prompts you for node-specific information, depending on the installation option you selected in the previous step.

Refer to "Forte Environment Information" on page 84 for a description of the information you must provide to the installation program.

8 Confirm your Forte installation options.

9 After you confirm your Forte installation options, the installation program prompts you for information about your environment.

Requested Information	Descriptions
Is your SYS$TIMEZONE_DIFFERENTIAL correct?	If you answer yes, the installation proceeds. If you answer no, the installer walks you through a series of questions to set your system timezone environment. Consult your system administrator before changing the SYS$TIMEZONE_DIFFERENTIAL
Create a Forte server account?	This account, with a username of "FORTE," contains the recommended process quotas for running Forte system software.
Run installation verification procedure?	If you answer yes, the installation verification procedure runs after installation.

After you answer these questions, the installation program checks that the disk is mounted and that it has enough free space for the installation. If either of these checks fail, the installation aborts.

The installation program checks for sufficient global sections and pages. If there are not enough, the installation aborts.

If the previous checks succeed, the installation program copies the installation files, installs the example applications (if this option was selected), and starts the appropriate system management processes.

For information about the command procedures the installation program creates for defining Forte symbols and logicals, as well as starting system management processes, see "After Installing Forte" on page 92.

Installing Forte 4GL–Runtime Only

Use the VMSINSTAL utility with the *Forte 4GL–Runtime Only CD* to install the Forte 4GL–Runtime Only software. If you are installing Forte 4GL software, refer to "Installing Forte 4GL" on page 86.

During installation, the install program offers you only the following option:

Option	Description
Install Client–Only Node	A client-only node cannot run any Forte server partitions, but is used to develop or run Forte applications.

For information on setting up a Forte environment, refer "Setting up a Forte 4GL Environment" on page 16. For a description of the information you must supply during installation, refer to "Types of Installations" on page 83.

During the installation process, to accept any default values, simply hit the **Enter** or **Return** key.

To install Forte 4GL–Runtime Only software on an OpenVMS node:

1 Mount the source directory for the installation.

If you are installing from the *Forte 4GL–Runtime Only CD*, log in to a privileged account and mount the CD–ROM drive.

The following examples illustrate the mount commands:

```
MOUNT/MEDIA=CDROM /UNDEFINED_FAT=(FIXED:NONE:32256) -
_$CD_ROM_device_name: -
_$RTV CD
```

Alternatively, you can run the following DCL procedure, which assists with the mount command for the CD-ROM.

```
$! Forte_CD.com:
$! Mount a Forte software distribution CD-ROM on an
$! OpenVMS node without specifying the volume name.
$! usage:
$! @Forte_CD device_name
$! example:
$! @FORTE_CD DKA600:
$!
$ devnam = f$getdvi(p1,"DEVNAM")
$ mount/noassist/override=identification 'devnam'
$ volume = f$getdvi(devnam,"VOLNAM")
$ dismount 'devnam'
$ mount/system/media=cdrom/undefined_fat=(FIXED:NONE:32256) -
 'devnam' 'volume' cd
```

2 Start VMSINSTAL, using "FTRTV" as the saveset name. For example:

```
$ @SYS$UPDATE:VMSINSTAL FTRTV CD_ROM_device_name:[AXP_VMS]
```

By default, VMSINSTAL restores the savesets to a temporary working directory on the system disk. If there is not enough free space on the system disk, this operation fails.

You can specify a VMSINSTAL alternate working disk by adding the following option to the VMSINSTAL command above:

```
OPTIONS AWD=disk:[dir]
```

3 Respond to VMSINSTAL prompts.

VMSINSTAL displays active non-system processes and prompts you to continue or abort the installation. It also prompts you to confirm the backup of your system disk.

Caution If any non-system processes are active, it is advisable to check with your system administrator before proceeding.

4 If applicable, confirm the OpenVMS version and shareable images.

The installation program performs a pre-installation check of the OpenVMS version and the versions on all Forte-required system shareable images. If the versions are compatible, the installation continues. If the versions are not compatible, the VMSINSTAL displays the current OpenVMS version, and prompts you whether to continue or abort the installation.

5 Enter the device name of the target node for the Forte software.

If Forte has been previously installed (that is, if FORTE_ROOT is defined in your environment), you are asked whether you want to install in the same location.

If Forte has not been previously installed, the installation program suggests the location SYS$SYSDEVICE:[000000]. However, you typically install Forte on a disk other than SYS$SYSDEVICE.

The VMSINSTAL program uses the location of the directory you specify to set the value of the rooted logical name FORTE_ROOT.

Caution Make sure that FORTE_ROOT points to the name of the physical device, *not* to a logical device name.

The VMSINSTAL program then displays the following options:

```
 Forte Runtime Installation
 --------------------------
  Install & Setup for the Forte Runtime System
  Q - Exit Installation Program
Press <Enter> to Continue or Q to Exit
```

6 Select an installation option.

Refer to "Types of Installations" on page 83 for information on these installation options.

7 The installation program prompts you for node-specific information, depending on the installation option you selected in the previous step.

Refer to "Forte Environment Information" on page 84 for a description of the information you must provide to the installation program.

8 Confirm your Forte installation options.

9 After you confirm your Forte installation options, the installation program prompts you for information about your environment.

Requested Information	Descriptions
Is your SYS$TIMEZONE_DIFFERENTIAL correct?	If you answer yes, the installation proceeds. If you answer no, the installer walks you through a series of questions to set your system timezone environment. Consult your system administrator before changing the SYS$TIMEZONE_DIFFERENTIAL
Create a Forte server account?	This account, with a username of "FORTE," contains the recommended process quotas for running Forte system software.
Run installation verification procedure?	If you answer yes, the installation verification procedure runs after installation.

After you answer these questions, the installation program checks that the disk is mounted and that it has enough free space for the installation. If either of these checks fail, the installation aborts.

Otherwise, the installation program copies and uncompresses the installation files, installs the example applications (if this option was selected), and starts the appropriate system management processes.

The installation program checks for sufficient global sections and pages. If there are not enough, the installation aborts.

For information about the command procedures the installation program creates for defining Forte symbols and logicals, as well as starting system management processes, see "After Installing Forte" on page 92.

After Installing Forte

This section discusses your Forte environment on OpenVMS, and OpenVMS procedures you perform after the installation is complete.

FORTE_ROOT Directory Structure

The installation program creates the rooted logical name, FORTE_ROOT, in your SYS$STARTUP:FORTE_STARTUP_*version*.COM file. FORTE_ROOT points to the directory tree of your Forte distribution.

Caution Do not change the structure of the FORTE_ROOT directory. The structure must remain intact for Forte to function properly—Forte relies on the path links within the structure to locate and use Forte components.

The installation program installs the FORTE_ROOT structure at the location you choose. You can later move the location of FORTE_ROOT, but you must keep the structure intact. If you move the location of FORTE_ROOT, then you must change the Forte logicals and path specifications in your SYS$STARTUP:FORTE_STARTUP_*version*.COM and SYS$LIBRARY:FORTE_LOGIN_*version*.COM files.

The following table describes the contents of the subdirectories in the FORTE_ROOT directory structure:

Directory	Description
FORTE_ROOT:[APPDIST]	Location for all application and library distribution files created when you make a distribution. Also, user-developed distributions can be placed here from a CD-ROM or other media so they can be deployed in a Forte environment. The Forte installer also places Forte system application distributions in this directory to be deployed when you install Forte system software. Refer to the *Forte 4GL System Management Guide* for more information.
FORTE_ROOT:[ENVDIST]	Exported environment definitions. This directory is empty at installation. For more information about creating and using environment definitions see the *Forte 4GL System Management Guide*.
FORTE_ROOT:[EXTERNAL]	This directory is empty at installation.
FORTE_ROOT:[INSTALL]	A large number of files and subdirectories, all devoted to executing the Forte development system. For a detailed description of the contents of the [INSTALL] subdirectory, see the table below.
FORTE_ROOT:[LOG]	Forte log files. For information about configuring the Forte logging facilities, see the *Forte 4GL System Management Guide*.
FORTE_ROOT:[REPOS]	Forte user repositories, including the example programs repository, created on demand at installation.
FORTE_ROOT:[SYSDATA]	Contains the environment repository and other information important to the Forte runtime system and Forte system management.
FORTE_ROOT:[TMP]	Files that the Forte system creates for its own use while Forte is running.
FORTE_ROOT:[USERAPP]	Location for all applications (Forte partitions) and libraries installed on this node. Only application partitions that run on a particular node are installed in the userapp directory of that node. Partitions are installed by Forte system management services during the application deployment process, and can include both user-developed application partitions and Forte system application partitions. Refer to the *Forte 4GL System Management Guide* for more information.
FORTE_ROOT:[WORKMSG]	Compiled message catalogs that you create for the purpose of internationalizing your Forte applications. For more information about creating compiled message catalogs, and internationalizing your Forte applications, see the *Forte 4GL Programming Guide*. This directory is empty at installation.

FORTE_ROOT:[INSTALL] Directory

The FORTE_ROOT:[INSTALL] directory contains much of what the Forte system uses to run itself, including:

- executables
- Forte shareable images
- seed repositories
- example programs (if you have installed them)
- scripts
- diagnostic tools

The following table describes the contents of the FORTE_ROOT:[INSTALL] directory:

Directory	Description
[.BIN]	The Forte executables that run Forte support processes and system-level applications, some of which, such as FTEXEC.EXE and FTEXECD.EXE, run Forte image repositories (interpreted applications built in Forte). The Forte executables that perform autonomous work using various Forte applications, such as ESCRIPT.EXE, and FSCRIPT.EXE. For more information about using and configuring the programs in this directory, see the *Forte 4GL System Management Guide*.
[.DIAG]	The Forte diagnostic tools, for use in consultation with Forte Technical Support specialists to diagnose Forte system problems. These tools use the Forte debugging files in the FORTE_ROOT:[INSTALL.BIN] directory, described above.
[.EXAMPLES]	A series of subdirectories containing the Forte example programs, which themselves consist of .PEX (Forte project export) and related data files.
[.INC]	A series of directories containing header and class definition files that define the Forte runtime. For example, the [.DS] directory contains files that define the Forte widgets.
[.LIB]	3GL libraries for inclusion in Forte applications that you build. The Forte shareable images (files with FORTE%%SHR*ver*.EXE names) are the compiled code extensions to the Forte system.
[.NLS]	Subdirectories containing native language services files, which you use in building international Forte applications. For information on building international applications, see the *Forte 4GL Programming Guide*
[.REPOSCPY]	The seed, or template, for a b-tree repository, and the node's system repository. The seed repository, btseed, consists, like any b-tree format repository, of two files: BTSEED.BTD and BTSEED.BTX. Whenever you create a new repository, the Forte system bases the new repository on this btseed template repository. The system repository, consisting of the SYSTEM.BTD and SYSTEM.BTX files, contains the Forte object definitions.
[.SCRIPTS]	Forte scripts, some of which the VMSINSTAL program uses in installing Forte on your node, and others which you can use or adapt to automate Forte tasks, such as starting and stopping Forte and Forte components. The Forte command procedures (files with .COM file types) perform autonomous work using various Forte applications, For more information about using and configuring the batch files in this directory, see the *Forte 4GL System Management Guide*.

Editing the System Files

After you have installed Forte on OpenVMS, you should edit the system startup and system login files, modify system parameter settings, set user and server process quotas, and test Forte, as described below.

We recommend that you edit the system startup file to provide for automatic startup of Forte when your system is rebooted, and edit the system login file to define Forte symbols. This editing must be done after networking has been started (DECnet and/or TCP/IP).

Editing the OpenVMS System Startup File

Typically, the system startup file is:

SYS$STARTUP:SYSTARTUP_VMS.COM

Add the following command to the system startup:

```
$ SUBMIT SYS$STARTUP:FORTE_STARTUP_version/USER=FORTE
```

This startup script contains a command to execute the server startup as a batch job. Make sure your default batch queue (typically, SYS$BATCH) is started before the startup script is submitted.

As an alternative, you can add the following command to the system startup file to start Forte as username SYSTEM:

```
$ @SYS$STARTUP:FORTE_STARTUP_version
```

However, make sure that you have set the file ownership:

```
$ SET FILE/OWNER=SYSTEM DEVICE:[FORTE...]*.*
```

Whichever command you choose, make sure it appears after the DECnet and/or TCP/IP startup. Because of the time it takes to start Forte server processes, this portion of the startup can take a while. Submitting to a batch job may be preferable for faster bootstrapping

Editing the System Login File

The system-wide login file is:

SYS$MANAGER:SYLOGIN.COM

It is recommended that you add the following command to the system login file, at a point where it is executed by all types of processes:

```
$ INSTALL :== $INSTALL/COMMAND
$ @SYS$LIBRARY:FORTE_LOGIN_version
```

As an alternative, only those users who are using Forte can put these commands into their personal SYS$LOGIN:LOGIN.COM files.

To make further login customizations, you can add the file FORTE_ROOT:[INSTALL.SCRIPTS]SITE_LOGIN.COM, which is automatically executed by the SYS$LIBRARY:FORTE_LOGIN_*version*.COM procedure.

Shutting Down Forte Server Processes

To perform an orderly shutdown of Forte server processes, enter the following command from a suitably privileged account (usually either FORTE or SYSTEM):

```
$ @SYS$STARTUP:FORTE_SHUTDOWN_version.COM
```

Note

If you run this command on a server or client node, it also shuts down the central server node. As you add or alter components of your Forte installation this command procedure may need to be modified.

Forte User Account Requirements

To work with Forte, user accounts on your OpenVMS system must have certain privileges and quotas.

User account

When you start Forte system applications (the Forte workshops, the Environment Console, Fscript, or Escript) or start Forte server partitions manually, you should use Forte user account privileges and quotas.

System account

When you start Forte system management services, such as the node manager or the environment manager, you should use system account privileges and quotas. All Forte partitions started by these services will then start under the system account.

To run Forte executables, you must have the following user privileges:

- TMPMBX
- NETMBX

To modify the quotas for Forte user accounts, you can use the following commands:

```
$ MCR AUTHORIZE
UAF> MODIFY USER/quota=xxx
UAF> SHOW USER
UAF> EXIT
```

Modify a quota value

Show quota values

If you have not added this line to the SYLOGIN.COM file, then have users set logicals and symbols by adding the following to their SYS$LOGIN:LOGIN.COM file:

```
$ @SYS$LIBRARY:FORTE_LOGIN_version
```

Forte Server Account Requirements

Server privileges

To start Forte system management processes, such as the environment manager, name service, and node manager, the following privileges are required:

- DETACH
- TMPMBX
- NETMBX

Server account quotas

Quotas for Forte server detached processes have defaults that can be overridden by logical names. The values of these logical names are translated only when the node manager creates its first process. If you modify any of the logical names and the node manager has already created a server process, you must stop and restart the node manager.

User account quotas

The following table provides the general guidelines for process quotas.

Process	Quota	Process	Quota
ASTLM	1500	PRCLM	8
BIOLM	500	SHRFILLM	0
BYTLM	300000	TQELM	100
DIOLM	500	WSDEF	1024
ENQLM	2000	WSQUO	5000
FILLM	300	WSEXTENT	40000 VAX 60000 AXP
PGFLQUO	100000 VAX 170000 AXP		

The following table shows the logical names (the corresponding quota is specified in the name) and the default value used if the logical name is not defined:

Logical Name	Default Value
FORTE_DETACHED_FILLM	300
FORTE_DETACHED_BIOLM	500
FORTE_DETACHED_DIOLM	500
FORTE_DETACHED_ASTLM	1500
FORTE_DETACHED_TQELM	100
FORTE_DETACHED_ENQLM	2,000
FORTE_DETACHED_BYTLM	300,000
FORTE_DETACHED_JTQUOTA	0
FORTE_DETACHED_WSDEF	1,024
FORTE_DETACHED_WSQUO	5,000
FORTE_DETACHED_WSEXTENT (VAX)	40,000
FORTE_DETACHED_WSEXTENT (Alpha)	60,000
FORTE_DETACHED_PGFLQUO (VAX)	100,000
FORTE_DETACHED_PGFLQUO (Alpha)	170,000

Testing Your Installation

You can test your Forte 4GL installation by running Forte in distributed mode.

To run Forte in distributed mode:

1. Use the following DCL command to login:

```
$ @SYS$LIBRARY:FORTE_LOGIN
```

2. Start the Forte workshops with either:
   - the DCL command, **forte:**

```
$ forte
```

   - or, use the DCL command verb, **vforte** (see $HELP VFORTE):

```
$ vforte forte
```

Using the Forte example applications

If you installed the Forte example applications, you can run them from the Repository Workshop.

To run the Forte examples from the demo30 repository:

1. Make a private copy of the demo30 repository.

   The VMSINSTAL program sets the demo30 repository permissions so that users cannot write to the repository. Therefore, you should copy the two repository files, DEMO30.BTD and DEMO30.BDX, so you can write to the new repository. To do this, use the following command:

```
$ copy FORTE_ROOT:[REPOS]DEMO30.* FORTE_ROOT:[REPOS]MYDEMO30.*
```

2. Set your display, if necessary:

```
$ SET DISPLAY/CREATE/NODE = yournode [/TRANSPORT=TCPIP]
```

3. Start Forte in standalone mode to run against your new demo30 repository by running either the DCL foreign commands or DCL command verb as follows:
   - the DCL foreign command

```
$ forte -fs -fr bt:FORTE_ROOT:[REPOS]DEMO30
```

   - the DCL command verb

```
$ vforte forte -
/standalone/repository=bt:FORTE_ROOT:[REPOS]DEMO30
```

Configuration Notes

Logical Names

The installation program creates two Forte logical name tables that track Forte logicals on OpenVMS. These tables not only prevent Forte logicals from cluttering the system logical table, but also make it possible to run several name services—and different versions of Forte—on the same server. This means that multiple environments can be configured, started, and maintained on a single OpenVMS central server.

The two Forte logical name tables are as follows:

Logical Name Table	Description
Global logical name table (FORTE_ GBLTABLE_*version*)	A system-wide logical name table. All Forte system-wide logicals, such as FORTE_ROOT, are stored here. This logical name table is created by SYS$STARTUP:FORTE_STARTUP_*version*.COM. This logical name table is created with a parent table directory of LNM$SYSTEM_DIRECTORY
Process logical name table (FORTE_ PRCTABLE)	A process-level logical name table. All logicals defined by Forte SETENV method are in this logical name table. The logicals in this table are passed to any child processes it creates. This logical name table is created by SYS$LIBRARY:FORTE_LOGIN_*version*.COM (which calls FORTE_ROOT:[INSTALL.SCRIPTS]FORTE_LOGIN.COM). This logical name table is created with a parent table directory of LNM$PROCESS_DIRECTORY.

Search Priority

The following table shows the search path hierarchy Forte uses in interpreting logical names. Forte respects user-defined names in the usual search order (defined by the LNM$DCL_LOGICAL). The search order, with the LNM$FILE_DEV logical set by the FORTE_ROOT:[INSTALL.SCRIPTS]FORTE_LOGIN.COM file, is listed in the following table:

Search Priority	Logical Name Table
1	LNM $PROCESS_TABLE
2	LNM $JOB
3	FORTE_PRCTABLE
4	LNM$GROUP
5	FORTE_GBL_*version*
6	LNM $SYSTEM
7	DECW$LOGICAL_NAMES

Network Protocols

OpenVMS platforms can support both DECnet and TCP/IP protocols at the same time. The definition of the logical name FORTE_LOCATIONS depends on your answers to installation questions and on your FORTE_NS_ADDRESS.

VMSINSTAL asks you whether the Forte name service accepts DECnet and/or TCP/IP connections. Depending on your answers, the definition for the logical name FORTE_LOCATIONS specifies that the name server accept DECnet and/or TCP/IP connections. In addition, the FORTE_NS_ADDRESS logical name is modified automatically to support either DECnet or TCP/IP or both.

Setting FORTE_LOCATIONS

The FORTE_LOCATIONS setting indicates which protocols Forte uses to accept inbound connections (that is, to respond to calls from remote processes).

In general, a node uses the same protocols for both receiving and initiating communication, however this is not always the case. There may be situations when a node wants to advertise only a subset of the protocols it is actually capable of receiving. For example, it may only advertise a DECnet location but initiate outbound TCP/IP connections.

If you want to customize your setup, you have to modify the definition of FORTE_LOCATIONS from those set by the installation program. The following commands illustrate this. In these examples, *version* is the ID of the Forte release, for example, “30n0”:

DECnet-only support

```
$ DEFINE/TABLE=FORTE_GBLTABLE_version FORTE_LOCATIONS -
  "qqDEFAULT_LOC::DECnet"
```

TCP/IP-only support

```
$ DEFINE/TABLE=FORTE_GBLTABLE_version FORTE_LOCATIONS
"qqDEFAULT_LOC"
```

DECnet and TCP/IP support

```
$ DEFINE/TABLE=FORTE_GBLTABLE_version FORTE_LOCATIONS -
  "qqDEFAULT_LOC::DECnet;qqDEFAULT_LOC"
```

Setting FORTE_NS_ADDRESS

The syntax you use to set FORTE_NS_ADDRESS varies depending upon the network services your setup uses.

The FORTE_NS_ADDRESS syntax for the three possible configurations is listed below. On the line beneath the syntax is an example for a node named Venus (using the installer's default value of "FORTE_NS" for the FORTE_NS_NAME and 30n0 for the Forte release number):

Syntax for DECnet only

```
$ DEFINE/TABLE=FORTE_GBTABLE_version FORTE_NS_NAME -
"DECNET_NODENAME:FORTE_NS_NAME::DECnet"
```

Example

```
$ DEFINE/TABLE=FORTE_GBTABLE_30n0 FORTE_NS_NAME -
VENUS:FORTE_NS::DECnet
```

Syntax for TCP/IP only

```
$ DEFINE/TABLE=FORTE_GBTABLE_version FORTE_NS_NAME -
"tcpip_nodename:tcpip_port_number"
```

Example

```
$ DEFINE/TABLE=FORTE_GBTABLE_30n0 FORTE_NS_NAME -
VENUS:1016
```

Syntax for DECnet and TCP/IP

```
$ DEFINE/TABLE=FORTE_GBTABLE_version FORTE_NS_NAME -
"DECNET_NODENAME:NS_NAME::DECnet;tcpip_nodename:port_number"
```

Example

```
$ DEFINE/TABLE=FORTE_GBTABLE_30n0 FORTE_NS_NAME -
VENUS:FORTE_NS::DECnet;venus:1016
```

Chapter 6

Installing Forte and the Forte Transaction Adapter on OS/390

This chapter describes how to install Forte 4GL software on an OS/390 node and the Forte Transaction Adapter for OS/390.

The Forte software for installation on the OS/390 platform comes on IBM 3490 tape media. The document *Restoring the Forte for OS/390 Product Tape* provides instructions for the MVS user who unloads the tape in preparation for installation. *Restoring the Forte for OS/390 Product Tape* is provided as hard copy with your Forte media distribution. For completeness, this information is repeated in this chapter.

This chapter contains the following sections:

- "Preparing for a Forte Installation"
- "Installation Procedure"
- "After Installing Forte"
- "Testing Forte"
- "Installing the Transaction Adapter for OS/390"

Preparing for a Forte Installation

Before beginning a Forte installation, you should read Chapter 1, “Installation Overview” on page 13. Chapter 1 provides background information on Forte that is helpful to planning and installing Forte 4GL and Forte 4GL–Runtime Only software. You should also be familiar with information in the *Forte 4GL System Management Guide* that describes how to set up and maintain a Forte system.

Platform Matrix

Forte has critical dependencies on operating systems, windowing systems, networking systems, runtime libraries, and database management systems. Before installing Forte system software, consult the platform matrix (at http://www.forte.com/support/platforms.html) to make sure the target platform meets the requirements for this release.

Your system must meet the minimal requirements for the following components:

Component	Comments
Operating system	The version of the OS/390 operating systems supported for this release.
Networking system	Nodes with distributed installations must be able to ping server nodes.
C++ compiler	Required if you intend to integrate 3GL programs with Forte applications or create compiled partitions and libraries.
Database systems	Required if you plan to access databases through Forte. The database environment variable for supported databases must refer to a valid database installation before you install Forte. Additionally, the environment variable providing access must be defined according to the database vendor’s instructions. For more information on database access, refer to “Understanding the fortedef Script” on page 111.
External interface	Required if you plan distributed access using third party tools.

Who Should Install the Software?

Forte system software for the OS/390 platform comes on IBM 3490 tape media, with standard labels, in IEBGENER format. The MVS user who unloads the tape and runs the Forte installation script must:

- be able to run MVS batch jobs
- be able to login to the UNIX Services environment (using OMVS, telnet, or rlogin)
- have read/write access to the Forte unload directory and the Forte installation directory in the Hierarchical File System (HFS)
- know how to edit and submit JCL from TSO
- know how to execute basic commands in the OS/390 UNIX Services environment

Requirements for Installation

The Forte system software and runtime system software for OS/390 requires IBM OS/390 Release 2.5 with Program Update Tape (PUT) maintenance level 9807 or later. You must have an MVS installation at or above the maintenance level required.

To unload and install Forte system software, you must first create a temporary directory in the OS/390 UNIX HFS that can be deleted after the installation is complete.

Disk space

The unloading directory requires at least 80 MB of disk space for the HFS path where you unload the software. The installation directory requires at least 240 MB of disk space for the Forte software.

Installation Options

"Setting up a Forte 4GL Environment" on page 16 discusses the types of nodes in a Forte environment. During installation, you select the type of node you are installing and provide information during the installation process.

Note

Forte for OS/390 can serve only as a deployment environment, *not* as an application development environment. You can install Forte Application Environment to set up your node as one of two kinds of server nodes or you can install just the Forte files.

During installation, you select the type of node you are installing and provide information during the installation process. The following tables list the types of nodes you can install on an OS/390 node and the information you need to supply the installation program. "Forte Environment" on page 104 provides descriptions of the information listed in this table.

For complete information about setting up a Forte environment, refer to the *Forte 4GL System Management Guide*.

Forte 4GL on OS/390 Node

Node	Node Property and Other Information
Central Server	Installation path Port ID for Forte Name Service DB2 CLI Initialization File name Environment name Distributed repository name Example applications
Server	Installation path Forte Name Service address DB2 CLI Initialization File name Distributed repository name Example applications
Forte files	This option copies only the Forte directory structure and source files to the target node, leaving the node setup for later.

Forte Environment

The following table provides details on the information you need to provide during the installation process for the Forte 4GL on OS/390. For information on the types of nodes you can install, refer to "Installation Options" on page 103.

Information/Nodes	Description	Default Value
Installation path *all nodes*	Location of the Forte directory structure. This location becomes the value of the FORTE_ROOT environment variable.	/forte
Port ID for Forte Name Service *central server*	A unique port ID on the central server node specifying the Name Service Address. The port ID must be a number between 1025 and 65536 inclusive. The Name Service Address identifies the node in the context of its Forte environment, and must therefore be a unique identity within the environment at any time. The address consists of the network name of the central server node and the specified port ID, separated by a colon (for example, *myserver*:5000). This is the value specified by the node's FORTE_NS_ADDRESS environment variable, which the installation program sets using the value you provide. When installing the central server node, specify only the port ID.	5000
Forte Name Service Address *server*	The address a server node uses to connect to the name service for the Forte environment. The name service is a Forte process running on the Forte environment's central server node, governing Forte communication among nodes in the environment. The address itself consists of the network name of the central server node and the specified port ID, separated by a colon (for example, *myserver*:5000). The port ID is specified during the installation of the central server node. The installation program uses the value specified for the Forte Name Service Address to set the FORTE_NS_ADDRESS environment variable. You should be able to ping the server by name if the name is part of the name service address, or by the IP address if the IP address is part of the name service address. Use the TSO ping command or the UNIX Services oping command if available, to ensure TCP/IP connectivity to the Name Service node.	none
DB2 CLI Initialization File name *central server* *server*	The name of the MVS dataset that contains initialization information required by the DB2 Call Level Interface (CLI). You need to set the Forte environment variable DSNAOINI to a value for this dataset name. For more information, refer to "Understanding the fortedef Script" on page 111 and also to the manual *Using Forte 4GL for OS/390*. The dataset name can be in either upper or lowercase and, if a PDS is being specified, the entire dataset name with the member enclosed in parentheses must be enclosed in quotes to prevent USS from treating the parentheses as special characters. See Chapter 4 of IBM manual SC26-8959, *DB2 for OS/390 Version 5 Call Level Interface Guide and Reference* for more information about creating this file.	

Information/Nodes	Description	Default Value
Environment name *central server*	A name used in managing the environment. If you plan to connect environments, each environment name should be unique to simplify specification in search paths.	CentralEnv
Distributed repository name *central server* *server*	The name of the central development repository a node uses in its Forte environment for collaborative application development.	CentralRepository
Example applications *central server* *server*	Several Forte example programs that illustrate how to use TOOL and the Forte classes. Examples are installed in the $FORTE_ROOT/install directory and consist of .pex (Forte project export) files and other related data files. For more information on the example programs, refer to the manual, *A Guide to the Forte 4GL Workshops*.	<install examples>

Installation Procedure

The Forte installation software for the OS/390 platform comes on IBM 3490 tape media, with standard labels, in IEBGENER format. The tape contains a UNIX tape archive (tar) file that contains the Forte Software.

To install Forte, you must unload the tar file into a temporary directory in your UNIX Hierarchical File System (HFS), run the UNIX tar command to expand the file, and then run the UNIX installation shell script INSTALL.SH to build your Forte distribution in a permanent location.

Depending on the installation options you choose, the installation script:

- requests certain environment information from you
- creates the Forte installation directory, and copies the Forte directory structure and source files to the installation directory
- sets the Forte installation's environment variables
- configures the appropriate Forte system management services for the installation

The following steps describe how to install Forte on an OS/390 node.

To install Forte 4GL on an OS/390 node with UNIX Services:

1. Log in to the UNIX Services environment using the user ID that will be used to unload the Forte product tape and install the Forte software.

   The user ID must have read/write privileges for files in the FORTE_ROOT directory where Forte will be installed.

   You can log in using either the TSO OMVS command, or by using an rlogin or telnet client on another system.

2. Create a temporary directory for unloading the tape.

   For example, to create /tmp/forte for unloading the tape, issue the UNIX command:

   ```
   mkdir /tmp/forte
   ```

Note Make sure that each file system has enough space available, as described in "Requirements for Installation" on page 103.

3. Log on to TSO.
4. Create and submit an IEBGENER batch job to unload the tar file from the 3490 tape cartridge into the temporary unloading directory created in Step 2 of this procedure, above.

Below is an example JCL file you can use to place the FORTE.TAR file into the temporary HFS directory /tmp/forte:

```
//FRTEUNLD JOB (0000)
//*
//UNLOAD   EXEC PGM=IEBGENER
//SYSIN    DD  DUMMY
//SYSPRINT DD  SYSOUT=*
//SYSUT1   DD  DSN=FORTE.TAR,DISP=OLD,
//             UNIT=3490,
//             VOL=SER=<volser_from_external_label>,
//             LABEL=(1,SL),
//             BLKSIZE=27920,LRECL=80,RECFM=FB
//SYSUT2   DD  PATH='/tmp/forte/forte.tar',
//             PATHOPTS=(OWRONLY,OCREAT,OEXCL),
//             PATHMODE=(SIRWXU,SIRGRP,SIROTH)
```

5 Log in to the UNIX Services environment again using the same user ID you used to unload the Forte product tape.

6 Expand the tar file that you unloaded in Step 4 of this procedure, above.

If you unloaded the Forte tar file into /tmp/forte/forte.tar, use the following two UNIX commands to complete this step:

```
cd /tmp/forte
tar xovf forte.tar
```

7 Navigate to the ALL_UNIX directory of the installation files and execute the installation script:

```
./INSTALL.SH
```

8 The installer prompts you for a target directory for your Forte installation.

```
Specify the Forte installation path (default is /forte):
```

If the target directory you specify does not exist, the installer creates it for you.

9 When installing Forte system software, the installer provides you with the following options:

```
               Forte Installation Menu
               ----- ------------ ----

    1 - Install & Setup for Central Server Node
    2 - Install & Setup for Server Node
    3 - Install Files Only
    q - Exit Installation Program

    Select Option [1, 2, 3, q (default is 1)]:
```

Refer to the previous section, "Installation Options" on page 103, for a description of the installation options.

10 As you proceed, the installer prompts you for additional information.

Refer to "Forte Environment" on page 104 for a description of the information you need to provide for each option.

11 Confirm your installation options.

For example:

```
CONFIRMATION:
-------------
Installation Option: Forte Development Install & Setup for Central
Server Node.

. . .

Do you wish to continue the installation with these options? (y/n,
default is y)
```

If you want to change a selection, specify "n" to abort the installation, and then start the installation script again.

After you confirm your choices, the installation proceeds to completion.

Note The installation aborts if the target disk is not mounted or if there is not enough free disk space for the installation to complete.

12 After installation is complete, remove the temporary directory where you unloaded the tape.

For example, if you unloaded the tape into /tmp/forte, you can remove the directory with the command:

```
rm -rf /tmp/forte
```

After Installing Forte

Your Forte installation on OS/390 contains the following components:

- FORTE_ROOT directory structure

  For information on this directory structure, refer to

  "FORTE_ROOT Directory Structure" on page 109.

- fortedef script

  The fortedef script is a shell script that defines the Forte configuration for your node in a series of environment variables. The installation script initially sets these values according to the information you provide.

  For more information on the fortedef script, refer to "Understanding the fortedef Script" on page 111.

- forteboot script

  The forteboot script is a shell script that you use to start Forte. The script contains commands to start Forte components according to a configuration you define. Initially, forteboot uses the default configuration defined by the fortedef script.

  For more information on the forteboot script, refer to "Understanding the forteboot Script" on page 113.

FORTE_ROOT Directory Structure

FORTE_ROOT is the directory you define as the target directory for your Forte installation. The installation script sets the location of your FORTE_ROOT directory as the value of the FORTE_ROOT environment variable.

Caution Do not change the structure of the FORTE_ROOT directory. The directory structure must remain intact for Forte to function properly—Forte relies on the path links within the structure to locate and use Forte components.

The installation script installs the FORTE_ROOT structure at the location you choose. You can later move the location of FORTE_ROOT, but you must keep the structure intact. If you move the location of FORTE_ROOT, then you should change any Forte environment variable that defines the location of files and directories in the structure.

The following table describes the contents of the directory structure defined by FORTE_ROOT:

Directory	Description
appdist	Location for all application and library distribution files created when you make a distribution. Also, user-developed distributions can be placed here from a CD-ROM or other media so they can be deployed in a Forte environment. The Forte installer also places Forte system application distributions in this directory to be deployed when you install Forte system software. Refer to the *Forte 4GL System Management Guide* for more information.
envdist	Exported environment definitions. This directory is empty at installation. For more information about creating and using environment definitions see the *Forte 4GL System Management Guide*.
external	This directory is empty at installation.
install	Files and subdirectories for executing the Forte development system. For a detailed description of the contents of the install subdirectory, see the table below.
log	Forte log files. For information about configuring the Forte logging facilities, see the *Forte 4GL System Management Guide*.
repos	Forte user repositories (including the example programs repository) created on demand at installation.
sysdata	Contains the environment repository and other information important to the Forte runtime system and Forte system management.
tmp	Files that the Forte system creates for its own use while Forte is running.
userapp	Location for all applications (Forte partitions) and libraries installed on this node. Only application partitions that run on a particular node are installed in the userapp directory of that node. Partitions are installed by Forte system management services during the application deployment process, and can include both user-developed application partitions and Forte system application partitions. Refer to the *Forte 4GL System Management Guide* for more information.
workmsg	Compiled message catalogs that you create for the purpose of internationalizing your Forte applications. For more information about creating compiled message catalogs, and internationalizing your Forte applications, see *Forte 4GL Programming Guide*. This directory is empty at installation.

Install Directory

The FORTE_ROOT/install directory contains much of what the Forte system uses to run itself, including:

- executable programs
- Forte dynamically linked libraries
- B-tree seed repositories
- example programs (if installed)
- scripts
- diagnostic tools

The following table describes the contents of the FORTE_ROOT/install directory:

Directory	Description
bin	The Forte executables, shared libraries, and a set of Forte batch files.
	The Forte executables run Forte support processes, system-level applications, some of which, such as ftcmd and ftexec, run Forte image repositories (interpreted applications built in Forte).
	The Forte shared libraries are the compiled code extensions to the Forte system.
	The Forte batch files perform autonomous work using various Forte applications, such as rpclean, Escript, and Fscript. For more information about using and configuring the batch files in this directory, see the *Forte 4GL System Management Guide*.
diag	The Forte diagnostic tools, for use in consultation with Forte Technical Support specialists to diagnose Forte system problems. These tools use the Forte debugging files in the FORTE_ROOT/install/bin directory, described above.
examples	A series of subdirectories containing the Forte example programs, which themselves consist of .pex (Forte project export) and related data files.
inc	A series of directories containing header and class definition files that define the Forte runtime. For example, the ds directory contains files that define the Forte widgets.
lib	3GL libraries for inclusion in Forte applications that you build.
nls	Subdirectories containing native language services files, which are used in building international Forte applications. For information on building international applications, see *Forte 4GL Programming Guide*.
reposcpy	The seed, or template, for a b-tree repository, and the node's system repository.
	The seed repository, btseed, consists, like any b-tree format repository, of two files: btseed.btd and btseed.btx. When you create a new repository, the Forte system bases the new repository on this btseed template repository.
	The system repository, consisting of the system.btd and system.btx files, contains the Forte object definitions.
scripts	Forte scripts, some of which the INSTALL.SH program uses in installing Forte on your node, and others which you can use or adapt to automate Forte tasks, such as starting and stopping Forte and Forte components.

Understanding the fortedef Script

The fortedef shell script (located at $FORTE_ROOT/fortedef.sh) defines the Forte configuration for your node in a series of environment variables, according to the information you pass to it at installation time. It also defines the appropriate s dynamically linked library path for your platform. For more information about setting environment variables, refer to the *Forte 4GL System Management Guide*.

Creating and Using fortedef Scripts

You can use the fortedef script as a template for creating other fortedef scripts for other Forte configurations, or for other users. To use your own fortedef scripts, you can either source them manually before starting Forte, or reference them in your .login file.

You can also include a fortedef script in your .profile file to automatically initialize your UNIX System Services environment for Forte access.

Forte Environment Variables

The following table lists the environment variables created or amended by the Forte installer for UNIX installations.

Environment Variable	Definition	Default Value
FORTE_LOGGER_SETUP	A string defining how Forte keeps logs of your use of Forte. You can use the Forte logging facility to track many kinds of Forte processes, and to isolate problems in Forte itself and in Forte applications that you develop. When you start Forte, the runtime system consults this key to determine what logging processes to implement. For more information on how to use Forte log files and the Forte logging facilities, see the *Forte 4GL System Management Guide*.	%stdout(err:sh:*)
FORTE_NS_ADDRESS	The Forte name service address for your node. The address of the name service for the Forte environment to which you are connecting your node. The name service is a Forte process running on the Forte environment's central server node, governing Forte communication among nodes in the environment. The address itself consists of two parts, separated by a colon, as in *myserver:5000*, the default value. The first part of the address is the network name of the central server node, and the second part is a number between 1025 and 9000, inclusive.	*myserver*:5000
FORTE_REPOSNAME	The name of central development repositories.	CentralRepository
FORTE_ROOT	The FORTE_ROOT directory contains your Forte installation: the executables and data files that compose the Forte system. For more information about the contents of the FORTE_ROOT directory structure, see "FORTE_ROOT Directory Structure" on page 109.	/forte
PATH	Updated to include the path to your Forte executables and shared libraries located in subdirectories of the FORTE_ROOT directory.	The path to the file in your FORTE_ROOT directory: FORTE_ROOT/install/bin
DSNAOINI	The name of the MVS dataset that contains initialization information required by the DB2 Call Level Interface (CLI). The value of this variable is used to set node properties as described in "Forte Environment" on page 104. For more information, refer to the manual *Using Forte 4GL for OS/390*. See also Chapter 4 of IBM manual *SC26-8959, DB2 for OS/390 Version 5 Call Level Interface Guide and Reference* for more information about the MVS dataset file.	Determined at installation.
LIBPATH	Updated to include the path to database libraries. You can modify the LIBPATH environment variable to include the library directory for databases you have added after the initial Forte installation. The LIBPATH variable must be set on the server where the database resides before you start the Forte Node Manager or Forte executable. LIBPATH settings are platform specific. For more information see *Accessing Databases*.	Automatically set at installation.

Understanding the forteboot Script

The installation script creates the forteboot script that you can use to start Forte or any of its components. The script contains commands to start Forte server processes.

Note The forteboot script is not created for Forte runtime software installations.

The forteboot script starts Forte system management processes according to the setup options selected during installation. For example, if you selected the central server setup option, the forteboot script starts an environment manager process and repository server process.

The forteboot script comes in two forms, one for the Bourne shell, and one for the C shell:

Bourne Shell $FORTE_ROOT/forteboot.sh

Creating and Using forteboot Scripts

You can modify the forteboot script to add whatever shell-based logic you like, such as prompts for using different fortedef files, or different command lines for starting various Forte applications. You can also use the forteboot script as a template to make other forteboot scripts.

Include the forteboot script in your rc.local file

You can include the forteboot script in your rc.local file to automatically bring up the Forte node manager and repository server whenever UNIX Services starts running in your OS/390 environment.

You should place the forteboot command at the end of your startup file, after the startup of TCP/IP INETD daemon. Because of the time it takes to start Forte server processes, this portion of the startup can take a noticeable length of time.

The following table defines the commands embedded in the forteboot.sh script:

Command	Purpose
source fortedef.csh	Sets variables as defined in fortedef file.
$FORTE_ROOT/install/bin/start_nodemgr -e *environment name*	Starts the environment manager process for the environment.
$FORTE_ROOT/install/bin/rpstart -fr bt: -n *repository name*	Starts the Repository Service for the environment.

You can modify the forteboot script to add whatever shell-based logic you like, such as prompts for using different fortedef files, or different command lines for starting various Forte applications. You can also use the forteboot script as a template to make other forteboot scripts.

Testing Forte

You can test your installation by running Forte in distributed mode.

▶ **To run Forte 4GL in distributed mode:**

1 Start your central server node processes.

You can start the processes by sourcing your forteboot script, which starts your runtime environment. For more information on setting up a Forte environment, see the *Forte 4GL System Management Guide*.

2 Using the **forte** command, start the Forte Repository Workshop on *another node* connected to the OS/390 Forte environment. (Forte for OS/390 does not support use of the Forte Workshops.)

For example, the following command starts Forte using the central development repository you specified during installation:

```
% forte
```

If you installed the Forte example applications, you can run them from the Repository Workshop on a non-OS/390 node in the environment.

▶ **To run the Forte examples from the demo30 repository:**

1 On any non-OS/390 node in your environment, start Forte in standalone mode to run against the demo30 repository using the following command:

```
% forte -fs -fr bt:$FORTE_ROOT/repos/demo30
```

For information about Forte command syntax and command flags, see *A Guide to the Forte 4GL Workshops*.

Customizing Sample Applications for Forte Application Server for OS/390

You can run the sample applications shipped with Forte if you observe the following restrictions:

- Any project making calls to the display library cannot be deployed on an OS/390 platform. You can, however, deploy it on a client node.
- The dmathtm project will not link correctly on OS/390 unless you remove the libc library reference from the dmathtm.pex file.

To fix this problem you need to edit the file dmathtm.pex and change the following line:

```
Extended = (External SharedLibs = '/usr/shlib/libc',
ExternalObjectFiles = '%{FORTE_ROOT} /tmp/examples/dmathtm')
```

The corrected line should read as follows:

```
Extended = (ExternalObjectFiles = '%{FORTE_ROOT}
/tmp/examples/dmathtm')
```

The TimeIt sample application does not run on OS/390.

Installing the Transaction Adapter for OS/390

This section explains how to do the following tasks:

- install the Forte Transaction Adapter for OS/390 software from the distribution media
- load the OS/390 example applications
- install and execute the installation verification programs for CICS, IMS, and APPC/MVS

Note For information about known problems associated with the use of the COBOLField class, please look up Bulletin 421 at *http://www.forte.com/support/bulletins.html*.

Requirements

The IBM 3490 tape cartridge contains the following files:

File Name	Purpose
FORTE.JCL	IEBCOPY unload of a partitioned dataset that contains JCL for defining, building, and installing the OS/390 components of the example applications
FORTE.SOURCE	IEBCOPY unload of a partitioned dataset that contains source for the OS/390 components of the example applications, as well as sample system definitions required for their installation

Each of the following requirements must be met before installing the Forte Transaction Adapter for OS/390:

- The current release of Forte 4GL for OS/390 must be installed on the OS/390 nodes where the Transaction Adapter will be installed.
- The current release Forte 4GL must be installed on the nodes from which the Transaction Adapter project APPC will be used in client applications.
- The supported release of OS/390 is running on the OS/390 nodes where the Transaction Adapter will be installed. Refer to the Platform Matrix at http://www.forte.com/support/platforms.html for the supported release of OS/390.

Note The filenames and label names used to load, install, and execute the Forte Transaction Adapter for OS/390 are dependent on the current release number for Forte 4GL. This section provides instructions for Forte 4GL Release 3.0.N.0. For subsequent releases, you may have to modify the filenames and label names accordingly.

Loading the OS/390 Examples

The example APPC/MVS, CICS, and IMS applications for the OS/390 system come on the same IBM 3490 tape media as the Forte Application Server for OS/390, as additional files in IEBCOPY unload format. The tape contains IEBCOPY unloads of two partitioned datasets, one containing JCL files and the other containing source files, as files 2 and 3 on the tape.

To install the OS/390 components of the example applications, you must load both partitioned datasets from the tape and then customize and submit the JCL to install the example applications. The JCL PDS is named FORTE.V30N0.JCL and the source PDS is named FORTE.V30N0.SOURCE. Note that if you rename the source dataset, you will have to change all references to it in the JCL.

To load the partitioned datasets from the distribution tape:

1. Log on to TSO.
2. Create and submit an IEBCOPY batch job to load the partitioned datasets from the 3490 tape.

   Below is an example JCL file you can use to load the partitioned datasets:

```
//FRTELOAD JOB(000)
//LOADJCL  EXEC PGM=IEBCOPY,REGION=4M
//SYSPRINT DD  SYSOUT=*
//INPUT    DD  DSN=FORTE.JCL,
//             DISP=(OLD,PASS),
//             UNIT=3490,
//             VOL=SER=FOR3N0,
//             LABEL=(2,SL)
//OUTPUT   DD  DSN=FORTE.V30N0.JCL,
//             DISP=(NEW,CATLG),
//             UNIT=SYSDA,
//             VOL=SER=volser,
//             SPACE=(27920,(4,1,5)),
//             DCB=(RECFM=FB,LRECL=80,BLKSIZE=27920)
//SYSIN    DD *
          COPY INDD=INPUT,OUTDD=OUTPUT
//LOADSRC  EXEC PGM=IEBCOPY,REGION=4M
//SYSPRINT DD  SYSOUT=*
//INPUT    DD  DSN=FORTE.SOURCE,
//             DISP=(OLD,KEEP),
//             UNIT=3490),
//             VOL=SER=FOR3N0,
//             LABEL=(3,SL)
//OUTPUT   DD  DSN=FORTE.V30NO.SOURCE,
//             DISP=(NEW,CATLG),
//             UNIT=SYSDA,
//             VOL=SER=volser,
//             SPACE=(27920,(10,2,5)),
//             DCB=(RECFM=FB,LRECL=80,BLKSIZE=27920)
//SYSIN    DD *
          COPY INDD=INPUT,OUTDD=OUTPUT
//
```

   In the above example, volser is the volume serial number of the DASD volume where you want to allocate the partitioned datasets.

Installation Verification Procedures

The installation verification procedures consist of defining APPC/MVS profiles, installing a simple application, and executing that application to verify that the Transaction Adapter can communicate with the OLTP system. For each OLTP system (APPC/MVS, CICS, and IMS) there is an OLTP application that consists of a simple transaction program that takes any input message, reverses it, and sends it back to the originator, and a Forte application to drive the OLTP transaction program using the Transaction Adapter.

Installation Verification for APPC/MVS

The IVP for APPC/MVS consists of the FRTMEX01 REXX program and the MVSivp Forte application. If you plan to use the Transaction Adapter to access native APPC/MVS applications that execute outside of the CICS or IMS environments, you should perform the steps described in this section to verify that the Transaction Adapter can successfully access an APPC/MVS application.

APPC/MVS System Preparation

For APPC/MVS, two system definitions are required: a side information profile and a TP profile. You build these definitions using the APPC/MVS definition utility. The name of the side information profile is referred to as the *symbolic destination name*.

- The JCL to build the side information profile is in FORTE.V30N0.JCL(FRTMEXSI).
- The JCL to build the TP profile is in FORTE.V30N0.JCL(FRTMTP01).

  The JCL contains detailed comments that describe how to customize the JCL for your installation.

To build the side information and TP profiles:

1. Locate the required JCLs.
2. Tailor the JCL in FRTMEXSI.
3. Submit the job to define the FRTMEXSI profile to APPC/MVS.
4. Tailor the JCL in FRTMTP01 to define the FRTMEX01 TP profile to APPC/MVS.

   Note that the TP profile contains the JCL that will execute the FRTMEX01 example program, and that this JCL must also be tailored before the job is submitted.
5. Submit the job to define the FRTMTP01 profile to APPC/MVS.

APPC/MVS Application

The source for the FRTMEX01 program is in FORTE.V30N0.SOURCE(FRTMEX01). This program is written in REXX, which is an interpretive language. Therefore, no preparation is necessary for the program.

Forte Application

The project export of the MVSivp project is in the FORTE_ROOT/install/examples/extsys/txadapt/mvsivp.pex file. Use the workshop to import this project into your workspace, and then deploy it as a client on the machine where you wish to run the application. The project deploys into two partitions, a client partition and a server partition containing the APPCApiSO service object. Make sure that the server partition is deployed on the OS/390 node where you have installed the Transaction Adapter for OS/390.

The MVSivp project contains two classes: Echo is the class that interfaces with the APPC/MVS REXX program using the Transaction Adapter classes, and EchoWindow is the window class that provides the user interface.

The application assumes that the side information profile FRTMEXSI has been defined on your system and accesses the APPC/MVS system where you have installed the REXX application. It also assumes that the REXX application name is FRTMEX01. If either of these names has been changed, you must modify the **Run** method of the Echo class to specify the correct names.

Execution of the IVP

To execute the APPC/MVS IVP:

1. Start up the client application on your client system.
   - On Windows NT, choose **Start > Programs > Forte Applications > MVSivp**.
   - On Unix, enter the following command:

     ftexec -fi bt:$FORTE_ROOT/userapp/mvsivp/cl0/mvsivp0 &

   A GUI screen will appear, with the Symbolic Destination Name field initialized to FRTMEXSI.

   If you have defined a different symbolic destination name, overtype this field with the correct name.
2. Click the **Run** button.

   The Text Received field should show the following text:

```
Congratulations, your application is communicating with APPC/MVS
```

Installation Verification for CICS/ESA and CICS/TS

The IVP for CICS/ESA and CICS/TS consists of the FRTCEX01 CICS program and the CICSivp Forte application. If you plan to use the Transaction Adapter to access CICS applications, you should perform the steps described in this section to verify that the Transaction Adapter can successfully access a CICS application

APPC/MVS System Preparation

The Transaction Adapter requires an APPC/MVS side information profile in order to access a CICS system. The side information profile is built using the APPC/MVS definition utility.

- The LU name that is referenced by the side information profile must be the CICS VTAM LU name.
- The JCL to build the side information profile for CICS is in FORTE.V30N0.JCL(FRTCEXSI).

  The JCL contains comments that describe how to customize the JCL for your installation. Tailor the JCL in FRTCEXSI and submit the job to define the FRTCEXSI profile to APPC/MVS.

CICS System Preparation

At many installations, the definition of new CICS transactions requires the involvement of the CICS system programmer or system administrator. If your site requires this, have the CICS system programmer or system administrator perform the definition of the CICS transaction.

The JCL to build the CICS system definitions for the CICS FRTCEX01 program is in FORTE.V30N0.JCL(CSDCEX01).

To define the CICS program and corresponding transaction:

- Tailor the JCL and submit the job to define the FRTCEX01 program and FR01 transaction to CICS. This job uses the CICS CSD update utility to build the definitions.
- Alternatively, you can manually enter these definitions into CICS using the CEDA transaction. After the definitions have been built, use CEDA to install the group to which the definitions were added. The JCL as shipped adds the definitions to the FORTE group.

CICS IVP Transaction

The source for the FRTCEX01 program is in FORTE.V30N0.SOURCE(FRTCEX01). The JCL to assemble and link this program is in FORTE.V30N0.JCL(FRTCEX01). Tailor the JCL and submit the job to assemble and link the program into a library accessible to CICS.

Forte IVP Application

The project export of the CICSivp project is in the FORTE_ROOT/install/examples/extsys/txadapt/cicsivp.pex file.

1 Import this project into your workspace using the Forte workshop.

2 Use the workshop to deploy it as a client on the machine where you wish to run the application.

   The project deploys into two partitions, a client partition and a server partition containing the APPCApiSO service object.

3 Make sure that the server partition is deployed on the OS/390 node where you installed the Transaction Adapter for OS/390.

The CICSivp project contains two classes: Echo is the class that interfaces with the CICS transaction using the Transaction Adapter classes, and EchoWindow is the window class that provides the user interface.

This example assumes that the symbolic destination name, FRTCEXSI, has been defined on your system and accesses the CICS system where you have installed the CICS transaction. It also assumes that the CICS transaction name is FR01. If either of these names has been changed, you must modify the **Run** method of the Echo class to specify the correct names.

Execution of the IVP

The first step in the installation verification procedure for CICS is to execute the CICS IVP transaction directly from a CICS 3270 terminal to ensure that the CICS transaction program is installed correctly. The next step in the installation verification procedure is to execute the CICS IVP transaction through the Transaction Adapter using the Forte CICSivp application.

▶ **To ensure that the CICS transaction program is installed correctly:**

1 Log on to your CICS system.

2 Press the **Clear** key.

3 Type the following text and press **Enter**.

```
fr01 This is a test
```

   The response TSET A SI SIHT 10RF should appear immediately following your original input.

4 Log off from your CICS system by pressing the **Clear** key, typing the following text, and pressing **Enter**.

```
cesf logoff
```

To execute the CICS IVP transaction through the Transaction Adapter using the Forte CICSivp application:

1 Start up the client application on your client system.

- On Windows NT, choose **Start > Programs > Forte Applications > CICSivp**.

2 On Unix, enter the following command:

```
ftexec -fi bt:$FORTE_ROOT/userapp/cicsivp/cl0/cicsiv0 &
```

A GUI screen appears, with the Symbolic Destination Name field initialized to FRTCEXSI.

If you have defined a different symbolic destination name, type over this field with the correct name.

3 Click the **Run** button.

The Text Received field should show the following text:

```
Congratulations, your application is communicating with CICS
```

Installation Verification for IMS/TM

IMS System Preparation

At most installations, the definition of new IMS transactions requires the involvement of the IMS system programmer or system administrator. If your site requires this, have the IMS system programmer or system administrator perform the definition of the IMS transaction.

With IMS, a stage 1 and stage 2 system generation must be performed to define the IVP transaction to IMS/TM. This must be completed before the transaction can be used. Sample IMS definitions for the transaction are in FORTE.V30N0.SOURCE(DEFIEX01). These definitions should be added to your IMS stage 1 source and then a system generation should be performed. At some installations, the IMS online change utility can be used to install the updates into the running IMS system without a restart of IMS. Your IMS system administrator should know whether or not this is allowed and should be involved in the process.

In addition to the system generation, IMS requires that a PSB and an ACB be built for a transaction.

- The source for the PSB for the transaction is in FORTE.V30N0.SOURCE(FRTIEP01).
- The JCL to perform the PSBGEN and the ACBGEN is in FORTE.V30N0.JCL(GENIEX01).

  This JCL should be tailored and then submitted to build the PSB and ACB for the application. At some installations, the IMS online change utility can be used to install these into the running IMS system without a restart of IMS. Your IMS system administrator should know whether or not this is allowed and should be involved in the process.

IMS IVP Transaction

The source for the FRTIEX01 program is in FORTE.V30N0.SOURCE(FRTIEX01). The JCL to assemble and link this program is in FORTE.V30N0.JCL(FRTIEX01).

To build the IMS transaction, tailor the JCL in FRTIEX01 and submit the job to assemble and link the FRTIEX01 program.

Forte IVP Application

The project export of the IMSivp project is in the FORTE_ROOT/install/examples/extsys/txadapt/imsivp.pex file.

1. Import this project into your workspace using the workshop.
2. Use the workshop to deploy it as a client on the machine where you wish to run the application.

   The project deploys into two partitions, a client partition and a server partition containing the APPCApiSO service object.
3. Make sure that the server partition is deployed on the OS/390 node where you installed the Transaction Adapter for OS/390.

The IMSivp project contains two classes: Echo is the class that interfaces with the IMS transaction using the Transaction Adapter classes, and EchoWindow is the window class that provides the user interface.

This example assumes that the symbolic destination name, FRTIEXSI, has been defined on your system and accesses the IMS system where you have installed the IMS transaction. It also assumes that the IMS transaction name is FRTIEX01. If either of these names has been changed, you must modify the **Run** method of the Echo class to specify the correct names.

Execution of the IVP

The first step in the installation verification procedure for IMS/TM is to execute the IMS IVP transaction directly from an IMS 3270 terminal to ensure that the IMS transaction program is installed correctly. The next step in the installation verification procedure is to execute the IMS IVP transaction through the Transaction Adapter using the Forte IMSivp application.

To ensure that the IMS transaction program is installed correctly:

1. Log on to your IMS system.
2. Type the following text and press **Enter**.

   ```
   frtiex01 This is a test
   ```

   The screen should clear and the response TSET A SI SIHT should appear on the third row of the screen.
3. Log off from your IMS system by typing the following text and pressing **Enter**.

   ```
   /rcl
   ```

To execute the IMS IVP transaction through the Transaction Adapter using the Forte IMSivp application:

1. Start up the client application on your client system.
   - On Windows NT, choose **Start > Programs > Forte Applications > IMSivp**.
   - On Unix, enter the following command:.

   ```
   ftexec -fi bt:$FORTE_ROOT/userapp/imsivp/cl0/imsivp0 &
   ```

   A GUI screen appears, with the Symbolic Destination Name field initialized to FRTIEXSI. If you have defined a different symbolic destination name, type over this field with the correct name.
2. Click the **Run** button.

   The Text Received field should show the following text:

   ```
   CONGRATULATIONS, YOUR APPLICATION IS COMMUNICATING WITH IMS
   ```